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On the Edge of Sustainability: Perspectives on Peri-urban Dynamics

Peri-urban

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This paper examines some of the many ways in which the peri-urban has been theorised, considering, in particular, the implications for a normative research agenda towards improved environmental and social justice. The paper discusses the value of different notions of sustainability in the context of the peri-urban, challenging the view that 'sustainability' is not an appropriate goal in relation to cities which are seen, by some urban theorists, as inherently 'unsustainable'. Drawing on examples, largely from south Asia, in health service provision, water management and agriculture and food systems, the particular challenges posed by the peri-urban situation in relation to environmental integrity and social justice are reviewed (in line with the STEPS definition of Sustainability which emphases that the objects being sustained are increasing levels of social justice and enhancing environmental integrity). The contribution of both peri-urban theoretical conceptualisations and empirical research to date in the context of Sustainability goals are reviewed, offering suggestions for complementary approaches and progression. Drawing on a notion of pathways (as self reinforcing trajectories of change - both existing and potential), alternative perspectives in planning and management of the peri-urban are considered through examples from policy and practice across sectors; initiatives to increase participation in urban planning processes; citizen action to mobilise access to key resources for the poor, and the engagement of poor and marginalised groups.

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About the STEPS Centre

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INTRODUCTION

Today's world is rapidly urbanising, with particularly radical urban expansion predicted in developing countries. Increasing urbanisation impacts on the peri-urban in terms of changes in land use, new forms of household composition, differential access to urban benefits (such as health infrastructure and employment) and increased pressure on common natural resources. Urbanisation brings the creation of new opportunities, but also a dramatic increase in the concentration of poverty and environmental degradation in peri-urban zones (UNFPA 2007) The peri-urban poor, in particular, are subject to increasing prevalence of 'shocks and stresses' (Allen et al 2006a: 22).

Urbanisation is accompanied by globalisation, which is associated with the creation of new urban economic cores, increased demand for services and new criteria for selecting and evaluating economic activities. This has advantages for some, but is frequently accompanied by the downgrading of public services such as water provision and waste removal (Sassen 2002; Shaw and Satish 2007; Shatkin 2007; Tacoli 2006). Economic globalisation, associated with new flows of media and information technology and climate change are transforming the political, economic and spatial order of cities. Although peri-urban neglect is prevalent in cities around the world, institutional provisions in developing megacities and global cities create new hierarchies with uncertain consequences for peri-urban dynamics and poor people. Despite offering immense opportunities, the peri-urban interface is little understood, often disregarded and characterised by increasing marginalisation and environmental degradation. In this uncertain and highly dynamic context, improved understanding of the peri-urban situation is an essential prerequisite to addressing the current and emerging challenges.

In recent years, some progress has been made in understanding the spatial, temporal and functional elements of the peri-urban interface, and in recognising the conflicts and some of the failings of current governance arrangements. However, there is a need to find approaches that address the conflicts and implement changes which will benefit the poor and marginalised. Approaches that will tackle poverty alleviation and social justice alongside environmental integrity, maximise the productivity of natural resources and draw upon synergies from urban and rural relationships. This will require interventions that move beyond established sectoral approaches with innovative means of bringing together emerging research and policy agendas and which create convergence between 'pro-poor' and 'pro-environment' agendas. As the first in a series of outputs from the STEPS peri-urban initiative, this paper discusses the rationale for this approach.

The paper begins by examining some of the many ways in which the peri-urban has been theorised, considering, in particular, the implications for a normative research agenda towards improved environmental and social justice. The paper

discusses the value of different notions of sustainability[1] in the context of the peri-urban, challenging the view that 'sustainability' is not an appropriate goal in relation to cities which are seen, by some urban theorists, as inherently 'unsustainable'.

Drawing on examples, largely from south Asia, in health service provision, water management and agriculture and food systems, the particular challenges posed by the peri-urban situation in relation to environmental integrity and social justice are reviewed (in line with the STEPS definition of Sustainability which emphases that the objects being sustained are increasing levels of social justice and enhancing environmental integrity). The contribution of both peri-urban theoretical conceptualisations and empirical research to date in the context of Sustainability goals are reviewed, offering suggestions for complementary approaches and progression. Drawing on a notion of pathways (as self reinforcing trajectories of change - both existing and potential), alternative perspectives in planning and management of the peri-urban are considered through examples from policy and practice across sectors; initiatives to increase participation in urban planning processes; citizen action to mobilise access to key resources for the poor, and the engagement of poor and marginalised groups.

[1] In general sustainability refers to the 'maintenance of system properties' and is an understanding based on the notion that a balance exists in nature which should be maintained through establishing equilibriums and managing competing demands on nature (Leach et al 2007: 2-3, 7) Urban sustainability is generally conceptualized as 'meeting the needs of the present without impoverishing future generations, and identifying areas of concern' (PUPSR-NRSP, 1999). It is seen as an integrative whole which includes issues of global equity of resource use for economic purposes, accommodation of people's basic needs, social justice and human rights and the perpetuation of environmental integrity. .

THEORISING THE PERI-URBAN

Defining, and thus theorising, the peri-urban is fraught with conceptual difficulties. The term 'peri-urban' has been used to define 'a place, concept or process' (Narain and Nischal 2007: 261). 'Peri-urban' thus refers to the urban fringe and the geographic edge of cities as a place, it refers to the movement of goods and services between physical spaces and to the transition from rural to urban contexts as a process and finally, as a concept, it refers to an interface between rural and urban activities, institutions and perspectives. In addition, as Iaquinta and Drescher point out, specific features that have been identified as definitional of the peri-urban context by some authors are interpreted as consequences by others. 'Consequently', they argue, 'the concept of the peri-urban has become trivialised and tautological, its analytical and practical utility severely compromised' (Iaquinta and Drescher 2000: 2).

In 1965, Mortimore and Wilson defined the area surrounding the Nigerian city of Kano as peri-urban because its close-settled character separated it out from both the less-dense rural hinterland and the considerably denser city. They noted that landholdings were much smaller than in rural areas and, in contrast to these larger landholdings, were under constant cultivation. Indeed, households closest to the city practiced the most intensive agriculture and were most dependent on this agriculture for their livelihoods. In Mortimore and Wilson's definition of the peri-urban, they focused on the 'mosaic' of land-use patterns, the accessibility of this area to the city, the diversification of household incomes, the proximity of markets, the availability of farm labour and the possibilities of off-farm employment (Mortimore and Wilson 1965). Forty years on from this work by Mortimore and Wilson, the peri-urban is still conceptualised as a heterogeneous mix of urban and rural features. The peri-urban is characterised by high, and often increasing, population density, small landholdings, rich countryside homes, poor slums, diverse sources of income, a lack of regulation, contested land tenure rights, uncoordinated conversion of farmland to housing, pollution, environmental problems, intensified resource exploitation, considerable economic dynamism and a severe lack of service provision (Friedberg 2001; Simon et al 2003; Briggs 1991). Other authors include proximity to the city, rural values and 'tradition', proximity to highways, industrial developments, commercialisation, urban 'vices' and changing agricultural practices as characteristic features of the peri-urban (Halkatti et al 2003). Notwithstanding these insights, understanding the peri-urban as a heterogeneous conglomeration of rural-urban features has resulted in an underlying assumption in the literature that the peri-urban is 'place-based'. It is often still described, for example, as 'midway between urban centres and rural spaces' (Dupont 2005) and as 'lying between cities and countries' (Cadène 2005).

Halkatti et al similarly argue that, in India, 'the constantly expanding periphery around a city constitutes the peri-urban interface' (2003: 149).[2]

Most literature has, however, gone beyond defining the peri-urban as a place where a mixture of urban and rural livelihoods are being pursued, and theorises about the peri-urban processes (Narain and Nishcal 2007). Friedberg has argued that the peri-urban is fundamentally integrated into urban contexts. As such, peri-urban areas occupy 'unique space, in that they are simultaneously sustained and imperilled by the dynamics of the urban economy' (Friedberg 2001: 353).

A place-based conceptualisation of the peri-urban[3] is thus juxtaposed with, and sometimes superseded by, a 'flows-based' understanding of the peri-urban which emphasises the 'flows of produce, finance, labour and services' and the influence of 'processes of rapid economic, sociological, institutional, and environmental change' (Halkatti et al 2003: 149). Recognition of these flows and processes, of the dynamism inherent in peri-urban spaces is evident in the use of the terms 'space', 'zone' or 'interface'. One definition is that that 'the "peri-urban" is an area outside existing urban agglomeration where large changes are taking place over space and time' (Dupont 2005). Picking up on the notion of change and time, Rohilla stresses the rapid trajectory of change in peri-urban areas as the critical feature (2005). Allen et al provide a working definition of the peri-urban – which overcomes the need to situate the peri-urban 'beyond' the city – as instances where 'where rural and urban features co-exist, in environmental, socio-economic and institutional terms' (2006a: 21).

Given the dynamic, shifting nature of the peri-urban, coupled with its indeterminate and ambiguous status as a place and/or space, questions about sustainability of the place, of the environment and for poor people become crucial. Conceptualisations of the peri-urban as transitional, as place-based, as flows-orientated, as urban or as rural have major implications for peri-urban planning and policy processes and these, in turn, affect the wellbeing of the poor and the sustainability of the environment. When regarded as a place, the peri-urban often becomes a site of expulsion with poor people being expelled or pushed out of the city to make way for visions of modernity, but it can also become seen as a threatening urban

[2] Introduced by Brook and Davila (2000), this term reflects academics' inability to characterise the processes inherent in peri-urban s/places, the difficulty of assessing how land is being used and the intricate and heterogeneous nature of relationships and processes. It is thus a reflection of the 'uneasy' nature of the peri-urban phenomenon and of the way its definitional features are negatives – such as the erosion of rural lifestyles and the absence of urban facilities (Allen 2003: 136)

[3] This paper does not attempt to review the massive contribution in the geographical literature on the spatial relationships between cities and their rural hinterlands. For a summary of this debate, see the Peri-Urban Production Systems Research Natural Resources Systems Programme (PUPSR-NRSP 1999)

fringe, where communities become associated with health and environmental hazards which require some form of mitigation and/or control. When regarded as a process it can be seen as a transition zone, where for example the retirement of rural activities are inevitable and therefore require little attention.

A flows-based approach has been used to understand the urban demand for fresh, high value foodstuff: this has been seen as a major enabling feature of the peri-urban because these farmers seek to develop very intensive, very small areas of land to serve this demand. Within this literature, the peri-urban zone is theorised in terms of contentious, conflictual politics between interest groups. However, Simon et al argue that these are not central issues in contemporary African (and other developing) peri-urban contexts. As such, in Africa, the peri-urban should be considered as an area of complementarity because of the enduring socio-economic interrelationships between these areas and cities. Such studies demonstrate farmers' innovative responsiveness to – and dependence on – market forces (Simon et al 2003: 40; Friedberg 2001). However, a straightforward analysis of economic linkages between the city and its periphery does not reveal how structural specificities of place and location shape the dynamic relationship between economic practices and the social institutions; nor does it address questions of sustainability. For example, paradoxically, peri-urban commercial food producers are 'simultaneously dependent on and threatened by a dynamic urban economy' (Friedberg 2001: 365). Exclusions and opportunities are thus often Janus-faced: it is through the exclusion of services, of regulation, of conservation and so forth, that opportunities are created.

The peri-urban should thus be conceived as an area of complementariness out of which arise various opportunities and exclusions. The interdependence between natural resources, agriculture and urban processes in peri-urban spaces suggests that complementarities do not exist in isolation from contestation. This interdependence creates, as Dupont's work in India shows, a climate of competition: for example, antagonisms emerge between poor people's need for housing and a general public desire to protect environmental features (discussed in more detail below); between the health and sanitation requirements of all residents and the chemical pollutants discharged by industries relocated from cities to the peripheries (Dupont 2005; also see Rohilla 2005).

These antagonisms are further perpetuated by the regulatory void characteristic of peri-urban contexts. For example, the peri-urban commercial food producers often depend on urban sewerage and solid organic waste to irrigate and fertilize crops and in aquaculture. However, as there is generally no formal acknowledgement of this, changes in the formal system can have significant ramifications for peri-urban famers. These farmers are not recognised as stakeholders and are therefore often bypassed as waste management is increasingly formalised (Hofmann 2005; Marshall et al 2005). The lack of regulation and the failure of authorities to provide services to the peri-urban have been variously theorised. That the peri-urban is not a top priority – or that the residents are not officially recognised or not entirely

legal – provides one set of explanations (Friedberg 2001; Moffat and Finnis 2005; Torres and Costa 2007); another is that rapid growth has 'outstripped the city authorities' ability to cope' (Simon et al 2003:43; Hofmann 2005). Others have pointed to the disjuncture or 'institutional fragmentation' between different central and decentralised, rural and urban government authorities and roles (Allen et al 2006b: 335; Halkatti et al 2003; Dupont 2005; Hofmann 2005; Storey 2003),[4] and to weak management capacity in regulatory authorities' roles (Simon et al 2003). While the reasons for the lack of regulation and service provision are divergent, what seems clear from the literature on the peri-urban is that there is no precedent for rural and urban authorities to collaborate. In India, official attempts to control the peri-urban space result, as Jargowsky argues, in the augmentation of central authority and the increased development of master plans which occur in conjunction with the spontaneous growth of 'unplanned' settlements. The effect is that peri-urban areas experience both 'more and less regulatory oversight' (Jargowsky 2005).

Regulation – and the failure thereof – can also be seen as a deliberate strategy of 'fuzzy zones' which facilitates economic liberalisation and bolsters global capital's preference to invest in peri-urban areas (Arabindoo 2005). The political value of the lack of regulation is evident in Roy's work on economic liberalisation intersecting with what she calls the 'volatile geography of Calcutta's fringes' (2002: 139). Roy argues that the multiple and conflicting regulations create uncertainty which in turn assists economic liberalisation: the 'cacophony of land regulations that collide and merge, resulting in such ambiguity that the system of land tenure is rendered negotiable' (2002: 144). Arabindoo further suggests that, given global capital's preference for investing in peri-urban contexts, development authorities have been able to use these planning ambiguities to enhance their political power and to shift from relatively minor planning bodies to the 'overseer[s] of global investment' (2005; also see Leclerc and Bourguignon 2006). Another advantage is noted by Satterthwaite (2007) who suggests that regulatory weakness is a means of transferring environmental costs, incurred by production and consumption patterns in the city, to the surrounding peri-urban areas.

Theorising failures and regulatory processes in ways that enhance the sustainability of people's livelihoods without reducing their opportunities, while simultaneously ensuring appropriate management of physical environments and agricultural production is a huge challenge. The interrelated nature of social, economic and environmental systems (Moffat and Finnis 2005) further complicates analyses

[4] Storey, examining peri-urban contexts in Melanesia, points to the contradictions that arise when urban development occurs in areas governed by customary principles and which cannot be managed by conventional urban planning arrangements (also see Iaquinta and Drescher, 2000). In addition, urban expansion into 'customary land and villages beyond the periphery of town boundaries' has led to massive social, ethnic and political tensions which, in turn, undermines all authorities' ability to manage the changes.

and theorisation. Although the social and economic processes have generally been seen as contradictory and ambiguous, serving both to benefit some people and disadvantage others; it is clear that environmental quality does not have this contradictory character and there is general consensus in the peri-urban literature that the availability of environmental resources has deteriorated in peri-urban contexts. Ongoing urbanisation has thus resulted in: building developments on ecologically sensitive land; changing agricultural patterns; diminished open space; increased pressure on natural resources such as water; a lack of hygiene and sanitation infrastructure; industrial effluence; air pollution; inadequate provision of basic services and accumulated solid waste (Burte and Krishnankutty 2006; Simon et al 2003; Dahiya 2003; Agrawal et al 2003). This has very particular consequences because it is often the poor who depend most on the natural resources in the peri-urban context (Allen and Dávila 2002). Indeed, we should not forget that while the peri-urban is a place of opportunity for many, but is also often a 'degenerated periphery' and the 'most wretched of slums' (Jargowsky 2005). As discussed in more detail below, there has been a tendency to contrast the needs of the poor with that of the environment: middle class environmental movements have blamed the poor for environmental destruction, while overlooking the actions of industry, of building developments and of other powerful actors whose actions have environmental impacts (Zérah 2007). This failure to integrate 'brown' and 'green' issues of sustainability, points to the elites' ability to frame sustainability and development in ways which disempower the poor. Although, as Torres and Costa argue in relation to peri-urban settlements around São Paulo's metropolitan area, 'not all fast-growing [peri-urban] areas present high deforestation rates; in fact, some of them even show forest regeneration' (2007: 218), this is seldom acknowledged by policy makers and other powerful actors.

In theorising the peri-urban, it is vital to recognise that these contexts have been – and continue to be – highly affected by broader political and economic processes, such as colonialism, structural adjustment, wars, political independence, the cessation of conflict, liberalisation, and the global politics of development (Simon et al 2003; Friedberg 2001; Satterthwaite 2007). Globalisation – perhaps the most recent and pervasive of these broader structural processes – involves a 'new urbanism', a reshaping of what it means to be urban and how urbanisation processes play out in relation to global processes and politics (discussed in the following section). Globalisation, Appadurai argues, is generating 'new geographies of governmentality' (2002: 24) which change the relationships between cities and citizenship: wealthier 'world cities' perform like city-states and are able to operate independently of regional and national processes, while poorer cities have to seek new ways of articulating their voices and claiming space. Or, put differently, '[C]ities are replacing states in the construction of social identities' (Taylor 1995: 58 cited in Smith 2002: 436). In addition, a focus on financial flows shows that globalisation is creating 'new geographies and hierarchies of centrality' in which particular cities become closely integrated into a global economy and de-linked from their national economies (Sassen 2002).

These processes act upon – and shape – peri-urban contexts in sporadic, discordant, uneven and multidimensional ways. While there is widespread recognition in the literature that the peri-urban is part of a global world, there is little consensus on how to theorise this. For some, globalisation is an oppressive force which shapes the peri-urban. Thus Thong (1995) writes about a 'superinduced development' or growth stimulated by international processes, while Smart and Smart, citing Halperin, stress the effects of a global 'implosion' which erodes the core/periphery distinction 'through peripheralization of parts of the core' and through creating high technology islands[5] within third world cities (2003: 270). Arabindoo's work looks more specifically at change over a 40-year period and focuses on the relationship between global capital and local authorities, arguing that metropolitan planning authorities use the peri-urban areas as 'pawns', willingly offering them up as sacrifices in order to secure privatised and globalised partnership ventures. Arabindoo speaks therefore of the peri-urban interface as a place that is constructed as undeveloped and natural in relation to the city, or as a 'constructed primordialism', in that its transformation is interlinked with that of the metropolis, of liberalisation and of globalisation (2005; also see Smith 2002). Sassen similarly points out that globally connected cities are undergoing 'massive upgrading and expansion', but that simultaneously 'large portions of these cities fall into deeper poverty and infrastructural decay' (2002: 14). Contrary to expectations, the technologies that have facilitated globalisation have not concurrently eroded spatial or other inequalities. Urban peripheries are caught up in these processes and their experiences (in terms of opportunities, degradation and sustainability of people, of agricultural production and of the environment) are 'indicative of processes involving a political and societal vision of the city, displaying the need to envision the city as a world-class centre for global capital and transnationalised investment' (Arabindoo 2006: 18). Global capital's predilection for peri-urban areas thus ensures economic growth as well as increased polarisation within the peri-urban interface as demonstrated through the creation of gated communities and, in so doing, weakens the urban/rural dichotomy (Arabindoo 2006; Smart and Smart 2003). It does not, however, ensure sustainability for poor people, for crop production and animal husbandry or for the environment. The constraints of globalisation, the degradation of the environment and the lack of sustainability can be seen as the lot of the poor and of marginalised people struggling to survive in the peri-urban context, which – despite, or because of, their exclusion – offers new imaginaries and the possibility of better opportunities and livelihoods.

People's own perceptions and understandings of the peri-urban have been largely overlooked in the theorisation of the peri-urban. This, Iaquinta and Drescher point out, 'misses the reality of peri-urban, underestimates the prevalence of social change and misclassifies the experiences of numerous people and communities in the real world' (2000: 3). There are overwhelmingly negative associations of peri-urban existence and pejorative connotations inherent in the language of

[5] Such as computer software and hardware and pharmaceutical industries, decentralized industrialisation and, Information Technology clusters.

slums and squatters (Moffat and Finnis 2005) which suggest illegality, danger (Ferguson 2007) and a lack of legitimacy in the urban area (Storey 2003).[6] These derogatory associations are frequently internalised by peri-urban residents, who do not associate their lifestyles or identities with pride. This, in turn, influences the possibilities for organisation within the peri-urban context in terms of trust, networks, co-operation etc. and people's ability to engage with policy makers and other external actors (Moffat and Finnis 2005).

Notwithstanding the pejorative associations of the peri-urban with poverty, illegality and slums, some literature has focused on the potential for emancipatory practices in relation to gender. Kielman and Bentley show that in Bopkhil, a peri-urban setting in Pune, India, women's status can be seen to have improved if measured by the conventional indices: 'As compared to their mothers and grandmothers, women in Bopkhil thus have higher rates of literacy and education, delayed marriages, less manual work outside the household, less children and access to contraception' (2003: 529). Similar patterns are evident in Kolkata's peri-urban settlements where women have been involved in aquaculture (or ornamental fish culture). These women were not as vulnerable to food insecurity, ill health, and inadequate housing. Their living conditions, education, transport facilities and communication infrastructures were better than those of non-aquaculture women in other peri-urban villages (Bunting and Lewins 2006). Kielman and Bentley warn, however, against assuming a linear relationship between women's status and these changing indices. Instead, new and unfulfilled expectations lead to new tensions and stresses between and within genders. As women experience some aspects of modern life and as they are exposed to ideas of gendered emancipation, so their own 'failure' to do so becomes apparent. In addition, as Kielman and Bentley (2003) have shown, one form of 'emancipation' can lead to new forms of oppression. Thus women who no longer perform manual labour find themselves increasingly subjected to elite patriarchal vales. Similarly improved ideas of 'health' and awareness of health care available in urban areas can lead women to redefine their experiences of 'natural' women's diseases. Increased knowledge allows them to see themselves as 'at risk' and defines women's health as a political issue, but also acts to make poor and marginalised women more aware of their exclusion from health facilities and treatment. Simultaneously, peri-urban populations often experience shifts from 'traditional' health care systems to biomedical models of treatment (Kielman 2002; also see Allen et al 2006b who argue that peri-urban residents suffer from a combination of urban injuries and rural disease). This raises the question, both for Kielman and Bentley and for this paper (discussed in more detail below) about what women's own definition of being healthy might be, and to what extent they wish to – and indeed are able to – attain such a goal.

[6] Storey, in examining the Melanesian case, shows how towns have been – and continue to be – constructed as 'sites of historical exclusion, theft and privilege' as a result of colonial and later political and economic segregation. As a result, indigenous people are acutely aware that they are 'not welcome' (2003: 260) and that 'town was not for them' (2003: 63).

There is, in the development and peri-urban literature on planning and policy, increasing acknowledgement that rural and urban qualities endure both in cities and in the surrounding areas. Associated with this, is the recognition that the rural-urban dichotomy – on which planning is based – is inadequate (Allen 2003; Iaquinta and Drescher 2000). Further linked to this, is the realisation that conventional planning systems do not adequately address problems experienced in contexts such as the peri-urban interface where agricultural, natural and urban ecosystems are intertwined. These systems are all affected by – and in turn influence – both rural and urban flows and demands which, in turn, affect the systems themselves and their interrelationships. Allen therefore argues that 'environmental planning and management in the peri-urban interface cannot simply be based on the extrapolation of planning approaches and tools applied in rural and urban areas' (Allen 2003: 135). Instead, peri-urban planning requires a unique approach which draws together elements of rural, regional and urban planning.[7] She points out that urban planning has generally focused on integrating the peri-urban into the city through service provision (such as low cost sanitation or the provision of drinking water), development projects (micro-finance, community labour etc.) and participatory methodologies. However, 'all too often they remain outside mainstream government decision making, so results remain marginal to the development process' (Allen 2003: 142). Such approaches are additionally hampered by the power relations at play and the tendency for urban policy actors to prioritise urban, elite interests (see below). Allen therefore recommends that environmental planning 'create a balance between the formulation of long-term, cross-sectoral and dynamic strategies and the development of short-term interventions' (2003:142). As such, environmental planning for the peri-urban interface should be inclusory and participatory (bringing together a wide range of actors whose work might focus on rural, urban, regional or national level initiatives), should focus on natural ecosystems which cross rural and urban landscapes and should seek to create 'new forms of collaborative arrangements that transcend the boundaries between rural and urban' (2003: 144). In order to develop policy and management plans for the peri-urban interface, it is necessary for local, environmental, urban and regional planning needs to be addressed and balanced

[7] Allen sees the rural environmental planning perspective as attempting to address rural-urban imbalances through enhancing rural production, expanding industrialisation and creating integrated rural development programmes. Overall, such an approach appears to aim at improving rural lifestyles and infrastructure through addressing localized problems. What it fails to do is take a long term perspective or to consider regional and urban environmental dimensions. Regional planning tends to encourage a shared understanding of rural and urban issues and to move away from the very localized rural planning approach by developing and supporting networks and relationships between rural and urban areas. Finally, urban environmental planning tends to emphasise local governance and sustainability while seeking to manage complex urban systems and peri-urban settlements and simultaneously ensure environmental sustainability in the hinterland. Like rural planning, this urban approach tends to focus on short term solutions to basic infrastructural problems and overlooks long term processes (Allen 2003; also see Allen and Dávila 2002).

against each other. This involves an acknowledgement of power relations and an appreciation of the different actors, it requires careful conceptualisation of how different ecological processes play out and it necessitates broader inter-sectoral and more plural scales of governance (which incorporate notions such as space, time, networks, diversity and multiple institutions). In particular, however, such an approach must be creative, seeking to bolster the poor and marginal while simultaneously aspiring for environmental sustainability (Allen and Dávila 2002).

In terms of addressing questions of sustainability, Allen et al suggest that the peri-urban interface comprises a 'heterogenous mosaic' of environmental and productive ecosystems working in combination with socio-economic 'peculiarities' – competing interests and opportunities generated by and adopted by different classes or categories of people who all co-exist – which create and shape poverty in multidimensional ways (2006a: 21). Ultimately, Allen et al argue that the very poor living in the peri-urban interface experience far worse conditions than other peri-urban residents. These include higher insecurity, less income, insecure tenure, less access to – but greater dependence on – environmental resources, more dependents, lower education and fewer skills, greater migration and less male labour power. These conditions are compounded by extremely inadequate water and sanitation arrangements, overcrowding, exposure to biological and chemical threats and a lack of access to health services. In other words, being poor means greater exposure to the shocks and stresses of rapid urbanisation: 'What distinguishes the poor from the very poor is their ability to utilize urban opportunities' (Allen et al 2006a: 22). It is, however, not only the poor who suffer from sustainability issues in peri-urban areas. The interlinked nature of the peri-urban with both the urban and the rural means that questions about food production, about economic systems, about migration, about employment and the creation of mega or global cities, about the built environment are all interwoven into each other. Understanding sustainability – of poor people's lifestyles, of environmental resources and of agricultural systems – thus requires a careful look at what is happening in urban areas. As suggested by Ferguson, it is necessary to examine the 'tension between attempts at "formalisation" (especially in the form of "fixing" social and economic arrangements through documents and conventional quantitative measures) and a vernacular logic of practice that undermines and mistrusts such reduction and fixity' (Ferguson 2007: 72, drawing on Guyer 2004). As discussed below, we approach this through an exploration of governance, framings and pathways associated with a broad, normative notion of Sustainability that incorporates both notions of environmental integrity and social justice. This means that different actors might contest notions of Sustainability (though differing framings of which dynamics are in play, whether these matter and how they might affect a system). Ultimately, however, pathways to Sustainability will be created through collective decision-making which recognises that different actors have different goals and through directly addressing the trade-offs required to achieve a normative version of Sustainability (Leach et al 2007: 7).

In the context of STEPS, we see the peri-urban as a condition which encompasses aspects of rural and urban activities and institutions, where there is influence of rapid social, environmental and technological change and increasing marginalisation. In the context of the ongoing process of exclusionary urbanisation in India and elsewhere, cities have many centres and many peripheries, and 'periphery' in this sense is a sociological rather than a geographical term.

Whilst references to social justice and environmental degradation abound, it is apparent that Sustainability has been largely neglected in the theorisation of the peri-urban. This parallels the framings of policy stakeholders regarding the role and function of the peri-urban, which may seek to address environmental or poverty alleviation goals, but often fail to recognise the vital role that peri-urban management can play in this. Ultimately these oversights serve to lead us further away from achieving combined goals of environmental integrity and social justice, failing to recognise the vital role that management can play in peri-urban Sustainability.

CHALLENGES TO SUSTAINABILITY IN THE PERI-URBAN INTERFACE

In this section Sustainability challenges in relation to the STEPS domains of water; health; and food and agriculture in the peri-urban context are reviewed. We consider the contribution of both peri-urban theoretical conceptualisations and empirical research in furthering progress towards Sustainability goals to date. Beginning with water and health we move on to interactions with the food and agriculture domain, with particular reference to India.

WATER

Urbanisation and peri-urbanism in the global South have challenged the model of the 'bacteriological city' which is prevalent in the North (Gandy 2006). This is the model of universal water and sanitation provision that is usually public and follows on from the water and sanitation reforms of 19th century Europe. Following the 'Great Stink' of 1858 in London and the subsequent cholera outbreak which affected both the rich and poor, a series of reforms were initiated by government. Technological and political arrangements emerged towards centralised, universal public water and sanitation (as opposed to chaotic, ad hoc, expensive private sector provision). The experiences of the Great Stink gradually led to massive reforms. After several decades of trial and error, the urban environment acquired pipes, sewage systems and clean water in taps for both the rich and the poor. The Great Stink became a distant memory and there were visible improvements in human wellbeing and health (i.e. improved life expectancy and infant mortality rates, see Black and Fawcett 2008; Gandy 2006). This model is promoted as a crucial way to meet water and sanitation provision in most parts of the world (Gandy 2006).

While the success of the 'bacteriological city' has limits even in the North where privatisation in some places has led to disconnections of the poor, it has not taken off at all in the global South. In Third World mega cities and their peri-urban areas, state supplied water is usually provided only to the rich and the middle class. Sewerage and drainage infrastructure are usually poor. In Mumbai the sanitation problem is defined by ratios of one toilet seat per 500 inhabitants in the poorer districts. Only 11 per cent of poor neighbourhoods in Manila and 18 per cent in Dhaka have formal means to dispose of sewage (Davis 2004).

Globally, it is said that water scarcity will affect 1.2 billion of urban populations (FAO 2007), but in reality these aggregate figures do not reveal how water scarcity is highly differentiated and affects different social groups (i.e. women and men and rich and poor) differently. Simplistic notions of scarcity lead to simplistic solutions which may not be appropriate in today's dynamic world. The crisis in urban and peri-urban areas has often less to do with actual water availability but more to do with struggles over access to and control over a finite resource (Mehta et al 2007). Poor and marginalised people usually have unequal and poor access to water resources to meet daily livelihood needs and often lack a basic level of water that is necessary for human wellbeing and functioning.

UNCERTAIN DYNAMICS

Water is the 'lifeblood of ecosystems' and 'essential for many eco-hydrological functions' (Mehta et al 2007: 1). Water – and its accompaniment, sanitation – is also fundamental for people's livelihoods, well-being and production. Water is often conceptualised in terms of a 'natural water cycle', 'ecosystem', 'watershed' or 'river basin' in which agriculture, rain water, ground water sources, river systems and so forth are all interconnected and act in predictable ways. Once water is subjected to formalised management, it is frequently represented as an urban hydrological system (which is regulated, functions or malfunctions and is economically transacted according to various system properties – Niemczynowicz 1999; cf. McKenzie and Ray 2009; Black and Hall 2004; and Maria 2006). Yet water cannot be controlled, is constantly variable across both time and spaces, changes property (as it shifts between liquid, solid and gaseous forms) and cannot be manufactured. It is sometimes perceived as a common good which should be free for all who need it, but is often managed through economic principles. It is appreciated for both its economic and its symbolic connotations. A great spectrum of possibilities are associated with the management of water – from large dams to spring water marketed in small bottles, from highly technological irrigation systems to unmechanised handpumps; from a global water crisis to rain harvesting in peri-urban areas. Academic debates about water contrast the spectre of water scarcity – for which technological solutions are often proposed – with models which seek more equitable distribution and access – sometimes emphasising rainwater harvesting, recycling and other alternative sources of water (Mehta et al 2007: 3).

Water debates around sustainability have pointed to the impossibility of assessing natural resource depletion, compensation for future generations' social and cultural loss, how water affects wellbeing, or the financial or institutional costs. In addition, changing biophysical contexts and climate change have introduced new

uncertainties for people who manage water: water plans, engineering predictions and designs can no longer be relied on to forecast water flows, average rainfalls, cyclical floods etc. Although water is frequently cast in technical terms, as illustrated below, political processes and governance procedures shape water availability and access. Environmental, social, technological, and environmental aspects of water are intricately interwoven: 'each implicates and is implicated by the other' (Mehta et al 2007: 16). Conceptualising water – from a STEPS perspective and in a peri-urban context – thus involves an awareness of 'social, technological and ecological dimensions of complex, dynamic water and sanitation systems, and addresses whether they are sustainable in terms that poorer and marginalised people value, and which enable them to exercise agency in water and sanitation provision' (Mehta et al 2007: 14).

Supplying water and sanitation services to the city and its peri-urban fringe is characterised by uncertain dynamics - interlocking social, technological and ecological/ hydrological dimensions of water and sanitation in peri-urban areas. The expansion of the city and villages being absorbed into the city have led to increasing competition over scarce water through industry, domestic use, farm houses and recreation parks. Water is thus subject to severe pressure from agricultural, local non-farm and urban demands. This arises due to massive changes in land use, competitive demands for water and pollution from industry etc. People in the peri-urban fringe are exposed to risks due to exposure to liquid waste (e.g. effluents; GW contamination; water pollution). Furthermore, inadequate sewerage disposal often leads to cholera/ typhoid and health implications.

Changing technologies can also change water/ peri-urban dynamics and the ways in which access to water is contested. For example, in peri-urban Delhi, the Basai water treatment plant provides clean water to Basai residents and some irrigation. But the rise in the water table is leading to new water borne health concerns (Narain and Nischal 2007). Furthermore, new industrial complexes arising due to intense capitalist accumulation through global-local linkages usually deploy technological interventions which may be allowed to pollute in the peripheries (Marshall et al 2003).

Tenure insecurity often forces the poor to marginal lands or ecologically vulnerable areas such as flood plains (Indonesia) or mangrove areas (South Asia) which are more disaster prone. Their overuse can undermine the area's overall resilience (ibid). Peri-urban settlements can also undermine the regulatory functions of water services. For example, changes in use of river resources can change river flows and flood control mechanisms and slums in mangrove areas can undermine the resilience of urban ecologies to tsunamis and flooding (e.g. Mumbai). Environmental degradation in peri-urban areas leads to increased health risks. For example marginal flood plains and coastal areas are often sites of industrial and waste disposal. The impacts of climate change on low lying cities such as Mumbai and Dhaka will impact on the ability of local ecologies to meet local user's livelihood and basic needs.

In such a changing and dynamic space, it is important to understand how water systems change over time (e.g. groundwater aquifers, surface water sources, village ponds, water outlets). Little is known about how resilient hydrological and ecological processes are to complex peri-urban dynamics where a range of livelihood options are pursued, where land use is varied and where water quality is undermined by industry, changing use and new technological interventions.

THE CONTESTED NATURE OF WATER, ITS PROVISION AND GOVERNANCE

Water is a contested resource: though it is often considered to be a common pool resource, access and consumption are not equally distributed (Mehta 2003). In many parts of the world people no longer perceive water as a common good. As a result it is an issue that divides communities. Access to water reflects power asymmetries, socioeconomic inequalities, and other distribution factors, such as the ownership of land. Water has different symbolic and cultural meanings to different people (ibid and Baviskar 2006). There are conflicting and overlapping rights to water. The now universally accepted right to water is still contested with many countries and powerful players not committing adequate resources to realise this right.

Water in urban and peri-urban areas has mixed characteristics which in turn limits the formal possibilities of securing access but people's ways of accessing water show emergent and possible new pathways of securing water. It is also often excludable and characterised by unequal access due to power, poverty and exclusion (see Ruet et al 2006). Traditional water and sanitation engineering in most parts of the global South (especially in countries like India) have allowed for a kind of control and governmentality which makes some citizens enjoy abundant access to water whereas others are denied access. In Delhi's National Capital Territory, the affluent areas of Jorbagh and Chanakyapuri receive more than 500 litres per capita per day and slum dwellers comprising 40 per cent of Delhi receive only 30 litres per capita per day against the norm of 350 per capita per day (Hazards Centre 2004). Almost half the population in slums and peri-urban areas don't use toilet facilities. Even toilet blocks from Municipal Corporation of Delhi, Sulabh International and other NGOs may not be used because they are too expensive. Every time one has to pay INR 2.00 to 3.00 in order to use these toilets (ibid).

Other citizens may be forcibly resettled from the centre of the city to make way for urban regeneration and beautification projects. This allows some people's resources and water to be appropriated in 'public' interest (Ramanathan 2006).

Thus water from the hinterland is appropriated for the cities. This however raises the question of who is the public? Clearly, it is usually the rich and middle class, with those who are forced to give up their resources treated as second class citizens. In this charged space, there are diverse framings of who is legal and illegal and who has rights to water and sanitation.

Peri-urban sites often lack water mains and sewer lines. This is, in part, related to the low value of the land which, as a consequence, is occupied by poor people who cannot meet the high service installation costs. Informal or illegal access to water is linked to insecure tenure of land and housing rights. Similarly, it is very difficult to build sustainable sanitation systems due to tenure insecurity and dense housing. Thus, the lack of proper disposal of waste can lead to the faecal contamination of groundwater.

Housing settlements often follow village traditions, not conventional urban patterns of settlement layout, with no formal streets and no provision for services etc. Therefore is it difficult to install conventional sanitation and engineering systems. Besides, due to competing administrative jurisdictions, these areas may be overlooked (Solo et al 1993). Due to lack of secure tenure, financial institutions may not make loans and collect payments for water fees.

Often the infrastructure costs of extending a water line and sinking in new pipes are much more expensive than installing a new system all together (ibid). Still, even though piped water is made out to be very expensive, in reality water provision from vendor trucks and buckets costs far more than water from piped systems. It is estimated that families can spend up to 20% of their income on water in some parts of the world (Mehta and Canal 2004). In most cases, it is the poor living in informal settlements that pay more than higher income families who purchase water through the formal sector. It is not uncommon for the poor and marginalised to spend a very high proportion of their income on water in peri-urban areas. Due to unreliable public supply of water, and the need to constantly purchase water from vendor trucks and buckets, it is estimated that every year each household spends about INR 2,000 (Zerah 2000) which is considerably more than piped water would cost. While it is often argued that poor people are willing to pay for water and are already paying huge sums, it is often ignored that many poor social groups may not be able to pay for water or that decisions and the impacts of water payments are highly differentiated by gender, class and so on.

Water privatisation has often been advocated as a ‘solution’ to former inefficient public water systems and as a way to enhance access to water. However, it is well known that privatisation (be it a long-term concession contract as in Latin American cities or the more benign management or service contract) largely leaves peri-urban areas, slums and so called ‘illegal’ colonies unserved (see Allen et al 2006b). In peri- urban areas, both the poor and rich access water through a host of unconventional means. These include vendors, privately operated wells, gifts, clandestine connections (see Mcgranahan and Kjellen 2006). Families often

hook up illegally to water systems because the initial connection fee is prohibitively high (the combination of the cost of house connection plus the meter fee). Thus, local people draw on individual and collective solutions to access water.

In India, while large-scale privatisation such as in Buenos Aires and other Latin American cities does not exist, there are numerous private players in peri-urban settings. They provide water through tankers, by selling bottled water and by recycling waste water in urban regions. The private sector also over-exploits groundwater sources causing environmental hazards and negative externalities. These hybrid private players are not subject to any regulatory frameworks which can in principle be pro-poor and provide for basic environmental standards. It is not just the poor who are protesting against water privatisation. Even the middle classes joined the Water Workers' Alliance against the privatisation of the Delhi Water Commission and the influence of the World Bank and the giant transnational corporation Suez (Patel 2008). There are also striking examples of NGOs and trusts initiating local water and sanitation services in urban settlements in India (e.g. Sulabh International; Sparc in Pune and Mumbai and Avas, Banglalore – see Zerah 2003 and Satterwaithe et al 2005).

In peri-urban areas, there are competing claims over water. Water-scarce Chennai is a good case in point of competition over the allocation of water (e.g. between irrigation, domestic supply and industry as well as different users across the city and its fringes). In 2001, the water board entered into an agreement with the Tamil Nadu Electricity Board and farmers who supply 20 million litres a day to the Board (Ruet et al 2002). Farmers are paid INR 26 per hour and run their boreholes for about 20 hours to supply water to the city. This saves money for the Board because it has no investment costs for wells. This is also a good income for the farmers, who also sell water to private water tankers, and is supposed to be compensation for not doing agriculture.

Many farmers may prefer to sell water to the city rather than use it for their irrigated crops, but this creates social divisions in the countryside with the poorest farmers not gaining this wealth. 'Tubewell capitalists' who use tubewells to extract underground water which they sell to the city (Dubash 2002) no longer provide water to other dependent farmers whose agriculture is affected (Ruet et al 2006). This has led to a drop in land use and cultivated surfaces and an expansion of the city into the rural hinterland. The city is now directly reliant on the common property resources (ie groundwater) in the rural areas and this is mediated by the urban water board and industrial users. A quasi common good has been converted to a private good. Thus, even in rural areas, water supplies are fiercely contested and a public system is transformed to a penury economy type of supply (ibid).

APPROPRIATE/ INAPPROPRIATE TECHNOLOGIES AND LOCAL PEOPLE'S AGENCY

Largely, water and sanitation engineers rely on conventional service delivery systems for water and sanitation and adopt foreign engineering standards (Solo et al 1993). They eschew affordable and alternative technology because it requires much more user involvement and follow up. Furthermore, planners and donors may not appreciate bottom up and participatory processes such as community-led total sanitation which has been successful in peri-urban Kalyani in West Bengal. Simplified technological innovation (e.g sewerage systems in North-eastern Brazil) has turned out to be cheaper than conventional systems. According to Solo et al (1993), distrust and ignorance that engineers have about alternative systems translates to higher costs. In one settlement in Chennai, India, where there is no piped water supply and all available water is brackish, the Metro water board contracted a contractor to build, operate and maintain a desalinisation plan which, according to Ruet et al, has resulted in water being very expensive It is, ironically, one that the Waterboard considers to be a success in terms of servicing low income households despite the fact that the price of water excludes many people from taking advantage of this scheme. This expensive engineering project is thus neither a sustainable project nor a good and locally appropriate solution for poor settlements (Ruet et al 2002). This is one example of research that establishes the fact that demand-side solutions are generally not considered in the water sector.

There are several cases where local people have used alternative technologies (often against the will of engineers and technocrats) to come up with sustainable solutions to water use in peri-urban areas (see Satterthwaite et al 2005). In Cartagena, Colombia, an unconventional technology was used to develop improved sanitation. This was a low-lying swamp area and the new system replaced a conventional and expensive one that sunk in swampy areas. Instead, they filtered out sewage solids into septic tanks and liquids were moved in small-diameter pipes (ibid: 8). While local residents accepted the new system, planners and engineers were resistant because these techniques had not been taught in engineering schools. However, what began as a pilot has functioned well for over 10 years. This indicates the problems with conventional planning mindsets which experience difficulty conceptualizing sustainable and locally-appropriate solutions. Several studies have highlighted the need for more participatory approaches in water planning.

In Tijuana, Mexico, the urban poor settled on the banks of a river which is both flood prone and landslide prone. There could have been tragic circumstances. The Secretariat for Human Settlements and Public Works (SAHOP) intervened once it realised that these people were 'simply too poor to qualify for the traditional state-provided low-income housing' (Solo et al 1993: 7) and began

to sell unserviced, unoccupied *ejidos* (communally-owned agricultural land). The families bought the land and built roads and were responsible for water and sewerage. They collectively built as much of the public infrastructure as they could, including the construction of an aqueduct and sewer system. This indicates that with government support and foresight, both disasters along river banks were avoided and families got involved in sustainable urban development and regeneration (ibid: 7).

According to Niemczynowicz (1999) there is a lot of scope to catch runoff from impermeable surfaces in a city and its peri-urban fringes. This includes new methods for water reuse, rainwater harvesting, safe storage of rainwater, dew and fog. Similarly, dry sanitation could bring rapid and low cost alternatives for the poor along with re-using water in agriculture. INTACH in Delhi has been advocating conservation-based water supply – (i.e. harvesting rainwater, rooftop harvesting, conserving wastewater). Delhi is considered to be privileged with its 275 litres per capita per day when compared with cities like Chennai (Ruet et al 2006). Yet, Delhi still has water 'crises'. According to INTACH, the revival of the river Yamuna and promoting roof top water harvesting could help generate 675 million litres per day (mld) and 2,205 mld of water (Ruet et al 2002). Despite the tremendous problems accessing safe water and sanitation in peri-urban areas, peri-urban residents have displayed a lot of agency in gaining access to services. Residential areas begin as scattered huts without streets and connections to public services. Slowly, electricity and water may be sourced 'illegally' from nearby cables and pipes; local water markets emerge; streets are built and toilets are improvised. Political clout can emerge due to the presence of political leaders and public services are extended (Solo et al 1993).

Dahiya (2003) discussed the case of peri-urban Shri Shankara Nagar in Chennai. The accumulation of large amounts of solid waste, environmental degradation, and the consequent deterioration of living conditions triggered community driven development initiated by the civil society itself. Local residents not only put pressure on the locally elected representatives to remove accumulated waste and maintain public health. They also purchased tricycles and appointed 'street-beautifiers', who carried out daily door-to-door primary waste collection based on a service charge of each household in the neighbourhood. Once civil society organisations realised that peri-urban local governments were unable to provide secondary waste collection services regularly, they gradually moved beyond the daily self-help primary waste collection to compost waste generated in all the neighbourhoods. The composting unit at Shri Shankara Nagar in Pammal is run by *Shri Shankara Nagar Mahalir Manram* – the local women's organisation. It functions as a micro-enterprise located at the periphery of the urban area where vermi-composting of organic waste is done in a 45 day cycle. More than 80 per cent of waste generated in Shri Shankara Nagar and surrounding neighbourhoods is now composted, thus making the process of solid waste management economically and environmentally sustainable. The local government adopted this model of waste management after a long process of networking and lobbying by the local women's organization.

As Heynen et al argue (2006) there are many political, social, and economic conduits through which water flows as it becomes urban. These are physical and social and are issues about access and control, the right to water and the right to space in the city and its environs. Butterworth et al (2007) sought to develop tools to better understand the processes behind water related conflicts, and to facilitate negotiations between stakeholders in peri-urban areas, leading to successful practical interventions to address specific local issues in case study cities.

There are an increasing number of recorded examples of communities responding to inadequacies in formal provision for access to water. These form alternative and emergent pathways through which people strive to secure water provision when formal systems fail to do so. There are also examples of what Allen et al (2006b) describe as the concept of needs-driven, rather than policy-driven, practices for water access and sanitation in peri-urban areas. However, with some notable exceptions, there remains a paucity of peri-urban research that combines high grade academic research, empirical field studies and policy engagement.

THE FORWARD LOOKING RESEARCH AGENDA

Here, there are a number of important opportunities to develop the peri-urban research agenda: to include stakeholder narratives as part of an analysis of peri-urban dynamics, and in particular, to explore the interactions between social, technological and environmental dimensions in peri-urban water management, combined with and an understanding of how particular dominant pathways emerge. It is important to move beyond an understanding of general principles of good governance to understand alternative pathways (which are partially illustrated by the ways in which citizens mobilise for access to goods rights and services, but may also be seen through analysis of different modes of water interventions – project mode vs. large publicly funded/ the recouping of water supply and waste disposal), which may have been suppressed, but have potential to address wider Sustainability challenges and to encourage reflexive governance. Key issues that arise include goals, aspirations, concerns and priorities of different stakeholder groups, power and politics, the interaction between formal and informal provisions, the stake that people have in peri-urban water planning, and the characteristics and impacts of different types of interventions in the water sector, both internal and external to the system. In the midst of all this are the large scale technologies, based on urban growth priorities. This leads us to the Designs element of the STEPS initiative (Stirling et al 2007) which asks what features of processes and institutions in social appraisal enable governance most effectively to address choices among contending pathways to Sustainability, which best reflect the interests of the poorest and most marginalised people.

One important research gap is empirical analysis and deliberation that seeks to understand the institutional and governance arrangements that would enable science and technology systems to address emerging challenges in peri-urban situations, whilst engaging effectively across disciplinary and sectoral boundaries to meet the needs of the poor. STEPS seeks to do this, in the context of an explicit Sustainability agenda. This is not merely about setting new priorities for scientific research but in understanding the processes/incentives for science and technology institutions to be able to incorporate Sustainability goals in rapidly changing social, ecological and technological situations into policies and planning - and how these can be implemented. The need for this is particularly acute in relation to peri-urban water access and quality, which are rapidly worsening, whilst there is considerable investment in large scale conventional high tech water projects.

CHALLENGES FOR HEALTH IN PERI-URBAN SPACES IN INDIA

In the peri-urban areas of cities throughout the world the traditional diseases of poverty, such as dysentery and cholera, are prevalent alongside 'modern' diseases of affluence, such as heart disease and stress (Douglas 2008). From a public health point of view, the very nature of environmental and living conditions, as well as available livelihood strategies, which exist in peri-urban areas in many developing countries, place many of those inhabiting these spaces at risk of injury and ill health. Apart from a hazardous, polluted work and living environments, the social determinants of ill health and access to services are known to profoundly affect vulnerable peri-urban populations (Ompad et al 2007). A low social status, material deprivation, poor education and limited access to health care (whether due to a lack of services or an inability to afford them) can compound an already unhealthy situation for the most marginalised. Furthermore, within this population, there are those who are particularly susceptible, such as the very young and the immuno-compromised.

The health indices that exist for peri-urban populations confirm a general picture of social marginalisation. Malnutrition was found to affect 35 per cent of peri-urban children under four in the vicinity of Bangalore, using geographically appropriate growth tables (Chadha et al 1997). Chronic energy deficiency has also been documented in women in a part of peri-urban Kolkota, particularly amongst women engaged in long hours of agricultural labour and at some distance from their homes. These effects were compounded by poverty and the strain of bearing and raising children (Ghosh and Bharati 2005). Crowded living conditions and poverty are also indicated by the prevalence of certain infectious diseases. Tuberculosis

is hyperendemic in the slums of Karachi at 329 cases per 100,000 population (Akhtar et al 2007), a situation most likely reflected in comparable settings in India. Although it is well recognised that a diverse set of economic and political barriers, which often require negotiated access through gatekeepers, prevents poor people from accessing healthcare, patients' views are seldom prioritised. An operational study of two government clinics participating in the National TB Control Programme (a directly observed therapy initiative) in urban New Delhi focused upon the reasons given by patients for not completing treatment. These included several social factors that revealed the predicament of poor people, such as the need to move back and forth between rural and urban homes, long distances to the clinics and the urgency to get back to work as soon as they felt well, even in the absence of cure (Jaiswal et al 2003).

COMPLEX INTERACTIONS AND UNCERTAIN DYNAMICS

Environmental realities impact on health in several other ways. Many of the diseases prevalent in peri-urban areas are associated with waste. Many of these areas have little or no formal system for management of domestic or industrial water. Inadequate sewerage disposal and supplies of clean water causes diarrhoeal diseases from a wide range of pathogens, such as cholera and typhoid (Clasen et al 2007). Research conducted on children in a slum area of Kolkota concluded that the burden of cryptosporidium, a gut pathogen, could be explained by the poor sanitary conditions. Even though these cases were of asymptomatic disease, such infection by this pathogen is now thought to be a cause of malnutrition. The organism can cause severe illness in immuno-compromised and malnourished adults and children, a significant fact in peri-urban areas (Palit et al 2005). Serious viral diseases such as dengue haemorrhagic fever are documented to occur with greater frequency in tropical, marshy areas and areas liable to temporary flooding, where living conditions are poor, and insect vector breeding sites on liquid waste are abundant. An investigation of an outbreak in a peri-urban slum area of Chandigarh in India blamed a combination of climactic and environmental factors in an increasing crowded settlement. In particular, poor area maintenance meant there were many discarded containers filled with stagnant water in which mosquito breeding flourished (Ratho et al 2005). The same reasoning would explain why outbreaks of malaria are associated with similar conditions. Finally, poor air quality due to biomass fuel burning and industrial pollution is associated with a higher incidence of respiratory conditions.

Air and water pollution associated with industries sited in peri-urban areas presents a series of direct (through exposure or ingestion of pollution water and air) and indirect (for example through the consumption of food produce grown

in contaminated sites) impacts on human health. Not only are there the impacts of recognised contaminants, but also threats from newly emerging and little understood chemical compounds.

Marginalised people have limited options in terms of income generation, and in addition the prevalent work opportunities are frequently more lucrative than safer alternatives. Livelihood strategies such as garbage picking and solid waste processing invite injuries and a range of infections. Apart from such obvious risks, more hidden factors such as overwork and fatigue are associated with excessive hours spent in occupations such as agricultural labour or factory employment. Other occupationally-linked conditions are associated with work in poorly regulated industrial plants, such as in the asbestos industry.

Indeed, the environmentally precipitated and communicable diseases long associated with 'slum' conditions can certainly be found amongst the more disadvantaged inhabitants of peri-urban spaces in India. The decline of such conditions in northern countries is irrefutable proof that basic public health measures such as the provision of clean water and sanitation have considerable impact in reversing mortality. However, the public health literature focussed on 'developing' settings registers a growing concern also with the rise of morbidity (and mortality) from non-communicable diseases in countries such as India. This concern particularly centres upon those who have recently migrated to urban areas. Clearly conditions such as mental health disorders (for example depression) are closely associated with poor social conditions, and also with a high burden of suffering from other illnesses. Such non-communicable diseases constitute a considerable and under-recognised cause of morbidity (Miranda and Patel 2005). However there is also concern regarding the link between urbanisation and a documented rise in other, often chronic, non-communicable conditions such as cardiovascular disease, diabetes and certain cancers (see for example Ebrahim and Smeeth 2005; Beaglehole et al 2007). The epidemiological literature links this rise to changing 'lifestyle' factors associated with migration and adaptation to a more urban existence, such as an altered diet and a more sedentary lifestyle. Such changes may in fact be imagined by those experiencing them not as 'risk factors', but as a desirable shift towards fulfilling visions of 'modern' living. In peri-urban areas, where life can be associated with many uncertainties, and where access to services can in addition be hampered, these diseases are usually presented late when less can be done to halt disability.

Whilst the public health markers underscore the extent of environmentally generated ill health and epidemiologists augur a growing burden of chronic disease, it is important also to take account of people's own perspectives of their health status. This view can be sought by considering 'perceived morbidity' (Kielman 2002) and can reveal a more complex picture of the experience of living in the peri-urban. For example, Unnithan (forthcoming) adopts a qualitative methodology to explore the experiences of women in a peri-urban slum of Jaipur, in particular with respect to their children's health and their reproductive wellbeing.

The material reveals that migration to a peri-urban area was in many cases associated with greater reproductive autonomy and shifting gender relationships. Several women also reported an improvement in household economic status, but this did not necessarily translate into access to quality health care. Thus, whilst the women clearly pointed to the environmental and living conditions as deleterious to health, and complained about the effects on their children, the accounts are not purely negative.

This complexity is evident also in other instances where livelihoods made possible by the very nature of the peri-urban space confer advantages as they simultaneously bring with them a chain of hazards. In order to understand the occurrence of disease in such situations, one has to consider a broader context that involves people constantly balancing life-sustaining practices against the risk of ill health. The example of waste water usage for natural resource production illustrates this balance of health risks and benefits well (see for example review by Birley and Lock 1998). In several peri-urban areas in India, as elsewhere in the world, agricultural production (for example of vegetables or agro-forestry) can be sustained and augmented by access to liquid waste. Ready access to urban markets can make this a profitable and desirable form of livelihood. Bradford et al (2003), for example, describe how in Hubli-Dharward in India, liquid sewerage flows away from the city in canals and farmers then pump out the contents and channel it into furrows to irrigate crops, increasing their annual yield. Some risks are invisible, others more self-evident. Homemade filters have to be constructed to prevent contamination by solids, but articles such as needles from biomedical waste still manage to enter the irrigation furrows and can injure farmers. In addition, the water can have high concentrations of industrial pollutants. A high proportion of the farmers who stand in the furrows suffer from dermatitis of the lower legs. The water also has a high bacterial and viral count, and can contain the eggs of various nematodes. The resultant gut infections and worm infestations are responsible for a range of ill health. The use of waste water encourages pests, and such farming practices tend to increase the use of chemical pesticides. These enter the soil and water table. Furthermore, farmers tend to mix these chemicals with little protective gear and chronic exposure to substances such as organophosphates has noticeable health effects. Weeds are also a problem, and here women in the family or female contract workers provide the cheapest labour. As women are also the ones engaged in the work of food preparation, a failure or inability to employ adequate hygiene practices after contact with the liquid waste can place the entire household at risk of infection.

These health hazards extend to those who might consume the produce grown on the peri-urban small-holdings, including those who purchase from urban markets. Heavy metals from groundwater and vehicular pollution have been found in high quantities in the water and produce from peri-urban areas, and at lower levels in the soil (Marshall et al 2005; Singh and Kumar 2006). The levels of highly toxic lead and cadmium in some crops were far in exceedence of any international permissible limits, presenting a multitude of health threats, including carcinogenic

potential. Contamination with faecal and industrial pollutants affects vegetables internally and externally (Hofmann 2005). The risk is higher in cases where insects have bored holes into the vegetables. This can be addressed to some extent by washing (if water is available) and cooking (in the case of biological contaminants, but not heavy metals or other chemical contaminants), but some fruits such as cucumbers are eaten raw which increases risks. Aerial deposition of dangerous contaminants (such as heavy metals) can also present a significant direct threat to health through long term poisoning, and an indirect threat to health and livelihoods of the poor by impact on the yield and quality of fresh produce (Marshall et al 2003)

Thus the health challenges associated with the peri-urban reflect back to a multifaceted picture. The peri-urban environment may confer some potential advantages in terms of health status over rural living, such as due to an increased income or changing gender roles. However additional health hazards of various kinds abound. Furthermore, the process of urbanisation in and of itself has brought an increase in non-communicable diseases associated with disability, which is known to have additional impoverishing effects. Whilst these illnesses have to date been thought to be clustered in the so-called 'developed' world, the rise in countries like India now brings a double burden in settings where basic health indices are still poor.

A FORWARD LOOKING RESEARCH AGENDA

These complex dynamics associated with ill health in peri-urban contexts necessitate a careful exploration of the nature of inter-linkages between social, ecological and physiological spheres. In many ways the philosophy of primary health care, as originally set out at Alma Ata in 1976, incorporates such a view of health that extends beyond individual biology. Any agenda for sustainable wellbeing in peri-urban areas would have to hold such a broader view and would need to involve platforms for dialogue between policy-makers across a range of sectors, including for example health, agriculture and industry. A vision for improved health would need to begin with fundamental public health measures to improve living conditions, such as sanitation in order to curb infectious diseases and remove the spectre of epidemics from long-known conditions such as cholera, which have threatened poorer communities for centuries. Such an 'old' epidemic scourge is too easily ignored in the flurries of activity generated by 'new' emerging infections or diseases such as HIV/AIDS that can generate large amounts of funding for vertical intervention programmes. Even if measures to improve the environmental conditions in peri-urban areas for 'forgotten' populations might not in practice be a priority for public health planners, the spill over effect to more

affluent urban areas might generate cause for concern. Contaminated agricultural produce moves to urban markets, but slum dwellers also seek work in the homes, businesses and industries of the more affluent and can thus expose them to a range of microbes. It is interesting to reflect that historically, for example in colonial India, such concern about spread of disease between different social classes was used at times to justify the effective sequestration of 'high risk' groups, for example to the peripheries of towns. In this century, various framings of the range of health problems that exist for the peri-urban are likely to be equally reflective of prevalent fears and competing interests. Apart from the discourses of contamination and risk that infectious diseases so readily generate, the framings of the health challenges of peri-urban settings will also involve conceptualisations of the effects of urbanisation, that are linked to the increasing burden of 'lifestyle' illnesses. Such framings can postulate real and imagined chains of causation and incorporate different notions of the balance of state versus individual responsibility in combating ill health.

What kind of state health care provision would be argued by planners as appropriate to addressing such a broad range of health concerns in a sustainable way? It could be viewed as an obligation of the state to provide a combination of basic primary health care measures and accessible, affordable integrated services. Good primary care facilities for early detection are also central to combating the progression of non-communicable diseases, those initially 'silent' killers. Moreover, preventive measures such as education are seen as important in order to explain unfamiliar concepts such as the biological markers that constitute an initially 'invisible' illness, for instance a raised blood glucose that serves as the early indication of disease and being 'at risk'. Much attention has also been given to measures to encourage individual behavioural change.

The planning of adequate state health care facilities is a vital factor, but the broader picture of healthcare markets in Asia more generally suggests a complex reality that is germane to significant policy considerations regarding the provision of and regulation of health services. It is suggested (see for example Bloom et al 2008) that private sector enterprises in Asia have become alternatives to poor state services and are at times a more accessible source of health information and drugs. This observation raises questions about factors such as the regulation of antibiotic therapy in order to prevent drug resistance and quality of care in general. Research in India suggests that people do rely on unlicensed informal practitioners (Pinto 2004) or patent medicine vendors (Kamat and Nichter 1998) for their health services. In addition, traditional Ayurvedic practitioners and religious healers intersect, complement and compete with biomedical health personnel in providing services to the peri-urban poor in India. The mapping of health seeking behaviour is thus a vitally important dimension to gaining an insider's perspective of the 'perceived morbidity' in peri-urban areas and the narratives regarding visions for change as well as current and emerging pathways to Sustainability.

PERI-URBAN AGRICULTURE

Peri-urban agriculture (PUA) includes all agricultural activities that take place in the peri-urban setting and the livelihoods associated with it, such as fisheries, poultry and goat rearing, horticulture, floriculture, dairy farming, cattle farming and arable farming. Whilst there are some large scale operations, for example commercial floriculture, densely populated intensive smallholder agriculture is prevalent. Marginal local farmers and poor inner-city as well as rural migrants live side by side and may all be engaged in agriculture in peri-urban areas. Whilst poultry, vegetables and dairy produce are emphasised in the literature, staple crops are also grown, often for subsistence. With the urban poor spending the majority of their income on food, and limited transport infrastructure, peri-urban production plays a crucial role in meeting the need to secure a supply of fresh and affordable food for growing urban populations.

For poor peri-urban communities, agriculture forms a key part of often diverse livelihood strategies – meeting basic food requirements for some or all family members through home production, or as a source of income through sale of produce or employment opportunities as farm labourers. Whilst peri-urban agriculture benefits from relatively easy access to expanding markets (although poor marketing infrastructure and institutional support results in low prices to producers (Marshall et al 2003), both the pressures to adopt alternative livelihood strategies, and the obstacles to producing safe and affordable food that preserves environmental integrity are immense.

LACK OF RECOGNITION

The role of urban and peri-urban agriculture as a major source of produce, and as a means of improving food security and enhancing the livelihoods of poor producers, is increasingly described in the literature (Bakker et al 2000). There are also signs of a slowly emerging recognition of the key role that peri-urban agriculture can play in food security (Ruel et al 1999). This recognition is, in part, due to the fact that peri-urban production has, on occasion, averted expected food crisis in developing country cities associated with structural adjustment programmes or economic collapse (Lee-smith 2008). However, there remains a lack of widespread recognition in policy and practice, and despite the increasing demand for affordable fresh produce for urban populations, the peri-urban interface is often perceived as a temporary ‘belt’ on the city fringes, and the retirement of agriculture is often seen as inevitable to make way for urban development.

A lack of empirical information contributes in terms of both cause and effect to the lack of planning and policy awareness. There is little documented about agri-food system flows and associated flows of resources and nutrients from rural to peri-urban to urban or the complex socio-ecological systems related to livelihoods and food systems linked to the peri-urban.

Peri-urban agriculture is further disadvantaged as it often occurs outside the jurisdictional boundaries of municipal authorities, but close to the urban core – resulting in a deprioritisation by rural agricultural programmes of adjoining administrative units due to the inevitability of urbanisation. The informal or illegal nature of much peri-urban agriculture further contributes to the vulnerability of those that practice it. In and around some cities, dwindling formal opportunities are being replaced with an increase in informal ones, including temporary cultivation on land designated for development, or more likely farmers informally leasing/or selling rural land for construction. The role that peri-urban agriculture plays in relation to both the urban and rural hinterlands reveals important aspects of potential pathways towards peri-urban Sustainability, building on better conceptualisation of the multiple and diverse ways in which agriculture intersects with social, economic, environmental and health issues and the diverse perspectives involved.

LACK OF POLICY AND FORMAL INSTITUTIONAL ENGAGEMENT

Whilst some important progress is being made in terms of governance processes that recognise and support urban agriculture, the peri-urban situation provides additional ambiguities and challenges. Major international agencies are beginning to articulate the need to support policies and practices in related fields (such as urban planning) that recognise the significance of peri-urban agriculture and drive agricultural practices in dynamic urban and peri-urban settings towards sustainability goals (FAO 2007). Nonetheless, there remains a lack of knowledge and understanding of the dynamic interactions between agriculture and associated social, technological and environmental processes; and a lack of effective approaches to managing this contested zone in order to draw synergy from the urban-rural relationships and benefit the poor and marginalised.

The limited political and institutional support for peri-urban agriculture manifests itself in a myriad of ways on the ground. Land tenure issues, increasing fragmentation of land holdings, land degradation (brick kilns, toxicity) and lack of basic infrastructure e.g. reliable water supply and electricity for irrigation pumps are some of the factors that threaten the continuation of agriculture. These ‘push’

factors are coupled with the 'pull' of possible greater economic return from selling or leasing land (or in some cases selling water) for other purposes or seeking alternative paid employment.

One obvious set of threats to agriculture in peri-urban situations are the processes associated with urbanisation that lead to the loss or degradation of land that was previously available for agricultural purposes (e.g. Kelly 2006), or the disruption, diversion or complete loss of access to water or other basic services. For example, water being diverted from irrigation to new industrial installations or up-market housing, or electricity for pumps that enables production to take place. Natural resources are under increased pressure in the peri-urban areas because of the use of land for clay pits, quarries, sewage disposal tanks and garbage dumps, and as a result of air and water pollution from local industrial and urban sources (Druijven and Singh 1994). In some places there are problems of increasing soil salinity, whilst in others the water table is low and access to other water sources limited.

This all occurs with requirements for new housing colonies, industries, other amenities, and provision of building materials all out-competing agricultural land use. Brick kilns are ubiquitous in many peri-urban areas and, as brick production moves, the land is often rendered useless for agriculture due to the removal of topsoil. Coupled with this, there are incentives for farmers to lease land for brick kilns and other purposes prior to selling it for construction, or to sell water to private tankers rather than use it for irrigation. Because, however, political systems, local government responsibilities and cultural attitudes shape agricultural and peri-urban possibilities in different ways there have been variations from the above-described scenarios and some farmers have been able to benefit from the encroaching urban areas while still practising agriculture. Notwithstanding these variations, agriculture is frequently at the centre of many raging conflicts over resource use in dynamic peri-urban situations, and it often loses out to other interests. These outcomes will continue to dominate in the absence of land use planning initiatives that span administrative and disciplinary divides, or recognise agriculture as a core component of the urban natural resources system (Pothukuchi and Kaufman 2000).

This is increasingly recognised by international agencies. The FAO, for example, argues that there is a need to formally recognise urban and peri-urban agriculture in terms of its integration with rural agriculture, rather than to expect that these forms of agriculture will substitute for each other, as well as a need to move away from the 'temporary and crisis-oriented image' of urban and peri-urban agriculture. The FAO aims, instead, to establish the perception of urban and peri-urban agriculture as a productive, essential component of sustainable cities. This is coupled with the need 'to develop land and water policies that account for agricultural production in urban and peri-urban areas; and guide dynamic agricultural practices within and outside cities towards sustainability goals', which it identifies as economic, social, and environmental (FAO 2007). However, in

practice there is often very little understanding of peri-urban agricultural dynamics. In the absence of good reliable information on rural-urban food systems, leads to lack of appropriate advice and support on the ground for practitioners.

In a participatory rural appraisal study with over 1,000 farmers from 28 peri-urban agro-villages in the vicinity of Delhi and Varanasi (Marshall et al 2000), priorities and concerns in relation to agriculture were explored. The findings graphically illustrate the complex dynamics of the peri-urban situation, the linkages between health, water and agriculture, and role of PUA in the livelihood strategies of the poor.

Land acquisition and increased fragmentation of land were cited as the biggest concern by many groups involved in agriculture. The villagers described land not only as the biological basis for growing food, but also as the source of power and social standing. It is perceived as the basis for accessing other inputs like credit, as a hedge against inflation and as an avenue to increase their net worth, because land prices are on the rise. As the state is able to acquire land for development, many farmers feel forced to sell to private developers in advance and at a higher price. Some people hope to buy land further away from the city. However the negative psychological impact of land acquisition was apparent. Farmers in Haryana became demoralised at the prospect of losing their livelihood means and some described a perception that they may be on the brink of starvation. Alternative livelihood strategies are not open to all, with increasing competition for alternative employment such as in the construction industries.

Other high priority constraints articulated by the farming communities were as follows:

• Infrastructural constraints - notably poor roads, frequent power cuts (which farmers attributed to government prioritisation for emerging industrial complexes), erratic water supply and limited tube wells – forcing farming to utilise water from sewage canals for irrigation.

• External inputs constraints - difficulty in getting credit, increased dependence on costly inorganic fertilisers, high cost of seed and pesticides, high cost of medicines impacting on agricultural activities, health impacts due to ‘poisoning’ of crops by pesticides, lack of accessible extension services and agriculture-related training.

• Pest and insect and disease-related constraints - concern over a dramatic increase in crop pests and diseases which farmers attributed to forced changes to cropping patterns and agricultural inputs, in the absence of appropriate support.

• Pollution constraints - such as smoke and water pollution (both domestic and industrial) impacting on crop yield and quality, increase in garbage dumping, stagnant water increasing mosquito numbers which , in turn, makes people and buffaloes ill affecting production.

• Animal related constraints - the farmers reported a recent increase in stray animals and pests such as rats, which destroy crops and harvested grains.

• 'Organisational' constraints - the lack of communication between farmers and officials was cited as being a constraint upon agricultural productivity. Farmers in Varanasi described how their local co-operative centre also had to be closed down due to corruption and bankruptcy. They believe that many of the officials related to these village institutions are corrupt.

These examples vividly relay the complex interactions occurring in the peri-urban interface between water, health and agriculture. It is also clear that it is not only the rich and powerful interest groups that contribute to increased inequities in these peri-urban areas. Decrease in social capital, breakdown of kinship ties, and demographic changes are amongst the other factors responsible for an increase in tensions.

Peri-urban agriculture (PUA) presents both opportunities and threats which are framed in many different ways by different interest groups. Whilst it is vital to the livelihoods of the poor, it can be both a victim of and contributor to worsening land degradation and environmental pollution. Despite this, the opportunities for low external input agricultural systems integrated with urban waste management and food security strategies are immense, and include cost effective environmental management through productive use of organic waste as farm manure (Hubbard and Onamah 2001). However, there is little incentive for farmers to invest in any conservation measures, particularly with land tenure insecurity (Bowyer-Bower 2006).

PUA is subjected to increasing amounts of agricultural pollution from industrial and domestic and vehicular sources. This aerial and waterborne pollution can be associated with dramatic reductions in crop yield, visible quality, and rapid post harvest deterioration of produce (Marshall et al 1997; Marshall et al 2005; Sharma et al 2008; Agrawal et al 2003). In addition, there are impacts on food safety through both chemical and biological contaminants. For example, peri-urban vegetable production is often associated with heavy and increasing use of pesticides. Whilst high input agricultural technologies are promoted, there is generally an absence of advice/support and incentives for more sustainable farming practices, and techniques such as Integrated Pest Management (IPM) are not widely adopted in peri-urban areas. Similarly intensive livestock units may operate in the absence of appropriate waste disposal options resulting in significant health threats, for example from pollution of surface water with biological (parasites and other microorganisms responsible for communicable disease) and chemical contaminants (such as heavy metals), or contamination of groundwater with nitrates. Industrial processing of livestock products, notably tanneries, also uses hazardous chemicals and discharges hazardous waste (Birley and Lock 1998).

Clearly, pollutants in urban and peri-urban areas which can impact on the safety of crops grown in these areas (and marketed in the city), can have a dramatic and widespread impact on urban inhabitants. The impact on the poor may be disproportionately high as small-scale relatively poor producer-consumers are the predominant growers in these areas and poorer communities are often forced to live and farm in the most polluted areas and are more susceptible to the adverse health impacts from contaminated produce.

With such limited recognition of the vital and increasing role that PUA plays for the subsistence of the poor and for local and national economies, it is not surprising that there is little formal concern over environmental threats associated with food production in these areas. And in the absence of an understanding of peri-urban dynamics the solutions proposed can often further disadvantage the poor and marginalised, ultimately undermining the Sustainability of the peri-urban itself.

This is illustrated by the situation in Delhi. Peri-urban agriculture is crucial for the supply of fresh produce, and for local livelihoods and the economy (the majority of highly perishable vegetables come from the six districts immediately surrounding Delhi and are grown by farmers with less than 1ha of land (Lintelo et al 2002). High levels of fertilisers and pesticides are applied. In these same peri-urban spaces, hazardous industries and industrial complexes are purposefully sited, and wastewater (both domestic and industrial) widely used for irrigation. This situation presents many important issues linked to health service provision e.g. the spread of bacterial and chemical contaminants to the urban food chain or occupational health hazards associated with pesticide use (see health section). With a growing middle class in Delhi with increasing awareness of food safety issues, solutions can be proposed which further disadvantage the poor. In addition, middle-class demands for supermarket-orientated vegetables can distort aspects of peri-urban agriculture. Whilst there is a constitutional right to safe food for all, there is a risk to peri-urban farmers of changing/enforcing food safety standards in the absence of wider governance and institutional reform. Producers with no choice but to farm in polluted environments would lose income, and a potential premium price of ‘safer’ food can disadvantage poorer urban consumers.

This is just one area relating to peri-urban agriculture in which decisions are made in the absence of key knowledge, and with power and politics clearly disadvantaging the poor. The examples provided above give some insight in to a social-ecological system around peri-urban agriculture with a trajectory of decreasing resilience and rapidly increasing vulnerability of the poor. This is despite the enormous potential for peri-urban agriculture to contribute to the sustainability of growing cities and the rural hinterland.

THE FORWARD LOOKING RESEARCH AGENDA

A number of initiatives, such as CGIARs urban harvest programme are working to address some of the key knowledge gaps described above, linking agricultural livelihoods to environmental health and sustainability of cities. They also seek to create opportunities for dialogue between key stakeholders. The STEPS approach complements these initiatives by developing frameworks for understanding how and why particular pathways unfold, and developing tools for opening more socially just and environmentally sound approaches to agenda setting and management of the peri-urban interface. We will be working with stakeholders to evaluate current approaches to sustainable natural resource management in peri-urban contexts and to understand the implications of heterogeneity of residence, diverse framings and power relations in determining different outcomes with the aim of finding new pathways to Sustainability.

URBAN PLANNING AND RESTRUCTURING

While the previous sections have explored some of the less dominant understandings of urban planning, primarily though an exploration of diversity, intersectoral complexity and poor people's voices, this section examines some of the dominant trajectories in urban planning, with emphasis on the implications for poor and marginalised citizens and on Sustainability goals. Following this, and drawing on experiences in India, we explore promising initiatives which provide insights for improving participation and opening up diverse framings (of governments, experts and poor people) in relation to decision making processes for more Sustainable management of the peri-urban. This opening up involves debating contested knowledge and policy and exploring the manner in which decision-making processes, methods of appraisal and methodological tools can, in themselves, influence Sustainability pathways.

PERSPECTIVES ON DOMINANT TRAJECTORIES

Urbanisation, as suggested above, is often constructed as a process of economic growth and positive opportunity; with the peri-urban intimately interconnected in paradoxical and contradictory ways. Urban planning and restructuring is not a new phenomenon, having its origins in colonial desires to regulate unruly profusion and discipline residents by separating work from residential spaces, by dividing the city ethnically and by class; in effect, the making and controlling of subjects though delineating spaces and boundaries. As Ferguson argues:

> All across the colonial world, unauthorised urbanisation was seen as both disorderly and dangerous. Where modernist urban planning sought to established ordered, grid like spaces of hygiene and political order, it inevitably encountered actual urban realities that included spontaneously constructed and often illegal zones of shacks, slums, shanties and 'squatters'. Finding in such spaces both a troubling lack of 'legibility' (Scott 1998) and a necessary 'other' to Western modernist constructions of self (Mitchell 1988: 80-82), planners and officials treated the unruly 'native quarters' of their cities with disdain, mistrust, and even loathing. While they could never, in the nature of things, eliminate such 'unacceptable' forms of urban life, they could and did engage in more or less systematic programmes of harassment and violence toward them, ranging from piecemeal attempts to outlaw such forms of livelihood as street hawking to full-scale violent 'clearances' of whole neighbourhoods (Ferguson 2007: 72-3).

Colonialism sought to build cities in developing countries which mirrored western experiences of development, but which also sought to keep the 'unruly' and 'uncivilized' out of the urban areas. Much of the literature on urbanisation has explored the extent to which cities in the developing world are similar to western cities. South-east Asian cities have generally been seen as 'dysfunctional', characterised by overcrowding, congestion, decaying and inadequate infrastructure, deprivation and pollution (Dick and Rimmer 1998). Dick and Rimmer have recently argued that these cities undergo processes both similar to, and different from, those experienced by western cities. Similar processes, referred to as periods of convergence, have grown out of colonialism – which sought to regulate the city in terms of business and residential areas – and the recent rapid economic growth associated with globalisation and technology transfer – where wealth and status provide new impetus to minimise social discomfort through '[g]ated residential communities, condominiums, air-conditioned cars, patrolled shopping malls and entertainment complexes, and multi-storied offices' (1998: 2317). Post-colonialism, by contrast, provided opportunities for cities to develop spontaneously, unhindered by former colonial controls and ideals. During these periods, south-east Asian cities were 'turned inside out' (Dick and Rimmer 1998: 2309). Instead of large-scale rural urbanisation and increasing development of the city, the peri-urban hinterland became increasingly urbanised during post-colonialism. These areas, characterised by rural integration with the city and, more recently by globalised processes, have been termed 'desakota'.[8] The term reflects the integration of rural and urban features, for instance, '[i]n the extended metropolitan area, settlement has spilled beyond recognised urban boundaries and even beyond contiguous urban areas, especially along main highways' (Dick and Rimmer 1998: 2309).

Shatkin, in his critique of this 'convergence approach' to understanding urbanisation in developing countries, points to the failure to explore local agency in relation to globalisation and urbanisation (2007). He, like Harvey and others seeking to understand the process of city-making, sees the city as 'both product and condition of on-going social processes of transformation' (Harvey 1989: 3); focusing on the negotiated manner in which global and local actors influence the built environment (Shatkin 2007). Shaw and Satish, focusing on Bangalore and Kolkata, show how both local and global factors influence the process of urbanisation. Particularly important is India's economic reforms of 1991 which

[8] McGee initially introduced the term 'Kotadesasi' to refer to changes in the areas surrounding Indonesian cities. 'Kota' meaning town, 'desa' for village and 'si' referring to their amalgamation in new ways through economic integration. Reorganised as Desakota, the word has come to stand for six main features: a heavily concentrated population practicing intensive, small-scale agriculture; increased urban activities; good transport connections to cities; high unemployment providing cheap labour; large-scale movements and flows of people, goods and services; and 'a state perception' of invisibility (McGee 1991: 15-18; cited in Dick and Rimmer, 1998: 2305).

facilitated an opening up of the economy and attracted foreign investment (Shaw and Satish 2007; also see Kennedy 2007). Some developments – argue Shaw and Satish – result from the cities' own demographic needs and the internal economy associated with this. Foreign direct investment – in the form of electronic industries, textile manufacturing and more recently information technologies, business process outsourcing and knowledge process outsourcing – has also influenced the built environment of the city. Nonetheless, global and foreign factors are not equally at play in all cities and can be constrained by domestic entrepreneurial accomplishments which reduce the need for governing authorities to create an enabling environment for foreign investment (Shaw and Satish 2007). In India, this negotiated transformation takes a particular pathway: according to Fernandes, urban restructuring preceded the economic liberalisation in 1990s by first producing a 'purified middle class culture' that could inhabit and represent the globalising Indian nation (2004: 2424). This cultural production of a new middle class led to the creation of specific forms of material-spatial exclusion for segments of the working class and urban poor. Fernandes terms this process a 'politics of exclusion'; that is enforced by a 'politics of forgetting' which then enables the construction of particular forms of consumer-citizenship (Fernandes 2004: 2425). Put differently, the consuming middle classes push for the city to be transformed in their image and for their requirements.

Verma and Banerjee -Guha tackle the problem of urban restructuring from the perspective of urban planning. Verma, an urban planner, argues, in response to the widespread slum demolitions in Delhi, that there are statutory entitlements in the Delhi Master Plan for the urban poor, and that problems are not a result of the plan itself but of poor implementation: 'what we need to worry about is not rights per se, but that these entitlements are being consistently denied and downsized by all who are in charge' (2003: 8). Banerjee-Guha, in an analysis of the Mumbai Metropolitan Regional Development Plan and other government policies, argues that Mumbai's present plans and policies are drafted in accordance to its role in the liberalised economy: 'By disregarding the 60 per cent of the population who live in slums and a more higher percentage who form the teeming multitude of workforce, how these can be integrated with Mumbai's overall well-being and efficiency, remains a critical question (Banerjee-Guha 2002: 125)

The notion that planning is neutral, has been widely contested (Baviskar 2002; Shaw and Satish 2006; Shatkin 2007). Shatkin argues that much of the literature on urban planning has failed to consider the significance of 'politics and power relations', assuming instead that all actors have equal amounts of power at their disposal (2007: 9). Roy arrives at similar conclusions in his critical examination of Delhi's history of planning. He argues that the 'city planners only "plan" cities, they do not make them' (Roy 2004: 70). In his opinion, cities have their own logic of growth, with different interests competing with each other to make the city they want it to be for their own survival. City planners normally fail to see this central truth and they eventually end up catering only to the needs of those whose interests are most powerful.

Partha Chatterjee and Leela Fernandes conceptualise the phenomenon of urban restructuring as being driven intensely by the changing social characteristics of the city. Chatterjee argues in the context of Kolkata that a social divergence has essentially split the city into two.[9] One part can be considered as comprising citizens (civil society) and in the other are those who belong to a general category of 'the population' (or political society). The citizenship of the population in the city remains adhoc, as they are treated as not having any legitimate right to stay in the city. They are considered to be encroachers. On the other hand, the citizen (representing civil society) carries the moral connotation of sharing in the sovereignty of the state and hence claiming rights (2003: 175). According to Chatterjee:

> After a change in government policies towards the city in 1990s, there has been, without doubt, a surge in the activities and visibility of civil society. Organised civic groups have come forward to demand from the administration and the judiciary that laws and regulation for the proper use of land, public spaces and thorough fares be formulated and strictly adhered to, in order to improve the quality of life of citizens. Everywhere the dominant cries seems to be to rid the city of encroachers and polluters and as it was, to give the city back to its proper citizens (ibid: 178).

Chatterjee further elaborates that, since 1990, a managerial and technocratic elite and a new class of highly paid workers comprising of professional, middle and lower level mangers, brokers and middlemen of all kinds, has emerged in the city. However, this new economy also needs low wage workers (political society) but they will probably commute long distances without the protection of the old development state (ibid: 182). Thus, for Chatterjee, urban restructuring programmes play out the tensions between the cultures and work routines of the citizens as against the populations of the political society.

This notion that planning is a battle to assert dominance over areas of space which are negotiated and contested by many different actors is echoed in analyses of environmentalism in cities. Amita Baviskar (2002) and Usha Ramanathan (2005) argue that cities are being transformed in the name of 'environmental activism'. Baviskar explores such change as emanating from 'bourgeois environmentalism' (2002: 41). According to her:

> For the bourgeois environmentalist, the ugliness of production must be removed from the city. Smokestack industries, effluent producing

[9] Dick and Rimmer similarly point out that a 'separating out of two societies' is occurring in south-east Asian cities. Parts of the cities are now very similar to western – particularly United States – cities while other parts – where low income, poor, marginalised, unskilled and uneducated sectors of the population experience crumbling infrastructure, poor services and 'unmanaged' urbanisation – are seen as peculiar to south-east Asia (1988).

> manufacturing units and other aesthetically unpleasant sites that make the city a place of work for millions, should be discreetly tucked away out of sight, polluting some remote rural-wasteland. So must workers who labour in these industries be banished out of sight. Even people whose services are indispensable for the affluentto live comfortable lives – domestic workers, vendors and sundry service providers, should live where their homes do not offend the eyes, ears and noses ofwell-to-do (ibid).

In a similar vein, Ramanathan typifies slum demolitions in Delhi as being synonymous with 'clearing spaces', 'cleaning up cities', 'beautification', and as being directly linked to the creation of new spaces for the 'rising culture of malls and parking lots'(Ramanathan 2005). Using beautification and the notion of environmental preservation as a means to clear the poor from a particular area is not unique to Delhi. Zérah documents how environmentalists in Mumbai sought to have the poor cleared from the Sanjay Gandhi National Park. She argues that in Mumbai 'the clash between a "brown agenda", concerned with local and immediate issues that affect the poor and a "green agenda" dealing with the long term environmental sustainability, is even more exaggerated than in most other developing cities' (2007: 122). Although the judiciary were perceived as a neutral body, it is clear that the poor peri-urban residents were blamed for destroying the environment, while other urban actors whose activities also impacted upon the environmental reserves of the park, were not included in the framing of the problem. The impact of the rich and middle classes were never conceptualised as part of the problem despite their encroachment on the Park's environmental reserves (in terms of industry, stone quarrying, restaurants and large residential bungalows). In cases such as these, it is clear that the courts are willing to uphold the primacy of the environment and to consider environmental sustainability as – in their view – the most important form of sustainability. In addition, the expert committees constituted to examine the problem have vested interests in the park, are biased towards technical and scientific resolution[10] and hold pejorative views of the slum dwellers. Poor people's livelihoods are accorded scant attention and the poor and marginalised are settled or evicted with few attempts to compensate them or to facilitate these new changes.

Urban planning – and the unruly growth of the city – is also intimately connected with questions of identity, status and visibility which enhance middle class, elite and state anxieties about the management of urban space. Dick and Rimmer point out for example, that South-East Asian cities are shaped through a middle class 'preoccupation with comfort and security' which constructs public space as indeterminate and characterised by uncertainty (1998: 2317). In India, Baviskar argues, control over public space and the representation of this space is crucial: 'Delhi matters because very important people live and visit there; its image reflects the image of the nation-state. As an embodiment of India's modernist

[10] Which see nature as 'natural' systems working harmoniously and without human interference.

ambitions, the capital has been diligently planned' (2002: 90). These images, and the identities they support, contrast radically with pejorative preconceptions of the urban and peri-urban poor.

In Indian cities, little attention has been paid to how poor people – living in slums, in peri-urban zones or in marginal spaces – might be able to influence urban planning and the associated environmental issues. Instead, much of the literature emphasises the marginalisation of the poor and their inability to shape formal processes (Zérah 2007; Iaquinta and Drescher 2000; Kennedy 2007). Moffat and Finnis, writing about a Nepalese context, argue that '[i]n general, squatters experience limited power when attempting to garner the attention and services of municipal governments' and that there is little support for these actions from development agencies who fail to acknowledge the needs of squatters and slum residents (2005: 455). Moffat and Finnis identify land ownership as the central consideration in relation to poor people accessing services and negotiating with government departments over infrastructural provision. Because peri-urban settlements are seen as transitory or impermanent, officials have no incentive to provide services. Similarly, because residents are aware of their insecurity of tenure – and they are influenced by broader pejorative understandings of the peri-urban – they may believe that collective struggle to improve their living conditions will ultimately prove useless. Alternatively, as Qadeer and Roy suggest, the poor may play a significant role converting inhospitable land to prime real estate, but may still be hampered by their lack of entitlement. Tiny spaces – often defined as marginal or inappropriate for urban development – are frequented by migrant labourers, the homeless, the poor and other marginal and excluded urban populations. Little by little these spaces are made habitable, by 'levelling, filling and building up some facilities'. As the city grows and as this land becomes increasingly valuable, so the poor are evicted and forced to start again.

Such actions raise many questions about the Sustainability of these spaces for the urban poor. Qadeer and Roy argue that 'within the battle for survival, the environmental coordinates of health keep sliding downwards' (1989: 60). Focusing on Hyderabad, Kennedy shows how peri-urban developments may indeed highlight questions of environmental sustainability. For instance, one newly developed industrial complex is described as having the following goal: '… to create an enclave that "will provide a model for other urban areas in the country by providing clean air and water, high quality of services such as sanitation and waste management, and the best standards of power, housing and transport"' (Kennedy 2007: 102). This image of environmental sustainability and of high service provision is, however, precisely that of an enclave from which the poor are excluded. These 'islands of modernity', as Geissler (2008) would term them, intensify urban fragmentation and may undermine Sustainability – despite their illusion of high standards within the enclave – across the peri-urban context. They also reproduce colonial patterns of urban planning and exclude the poor.

For Appadurai, people resident in the slums of Mumbai are 'citizens without a city' (2002: 26). As slum dwellers they are divorced from the processes of 'new urbanism' created through globalisation by their incapacity to lay claim to the products of globalisation and urbanism, by their lack of visibility in urban life and by their failure to access housing:

> And their inability to document their claims to housing may snowball into a general invisibility in urban life, making it impossible for them to claim any rights to such things as rationed foods, municipal health and education facilities, police protection, and voting rights. In a city where ration cards, electricity bills, and rent receipts guarantee other rights to the benefits of citizenship, the inability to secure claims to proper housing and other political handicaps reinforce each other. Housing – and its lack – set the stage for the most public drama of disenfranchisement in Mumbai. In fact, housing can be argued to be the single most critical site of this city's politics of citizenship (2002: 27).

Appadurai's notion of the invisibility of the poor[11] (2002) is echoed by Arabindoo who speaks of the poor as 'silent spectators to the deluge of speculation and investment' (2006: 48). Globalisation, super connectedness and the remaking of urbanism simultaneously creates greater heterogeneity and reduced interaction between peri-urban residents. The peri-urban interface is not only a place for the poor and the marginalised, but is also a context in which the elite and wealthy can benefit from economic liberalisation and bureaucratic ambiguity (Jargowsky 2005; Allen 2003). In addition, alliances are not necessarily tied to communities or neighbours. Rather, '[B]odies may inevitably be located in particular places, but imaginations and loyalties need not be' (Smart and Smart 2003: 275). Authors such as Appadurai, Arabindoo, and Smart and Smart are concerned that such processes obscure the needs – and undermine the mobilisations – of the poor. It is thus crucial that policy processes, planning and management actively address the tensions inherent in the peri-urban interface. Shatkin's focus on the politics and power relations is useful here. Questions such as '[w]hat political and economic interests do urban development outcomes represent' and how can planners 'foster more equitable outcomes' (Shatkin 2007: 10) are critical to understanding urbanisation, the built environment and the peri-urban interface. Such questions about framings are also critical for thinking about Sustainability – of people, of agricultural production systems and of the environment – within the peri-urban interface and in relation to the urban context.

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[11] Although the poor are out of sight when considered from the perspective of the government and the state, paradoxically their daily lives are characterised by a severe lack of privacy in relation to family, neighbours and community members.

These questions – of visions, politics and power – are likely to prove fundamental in current revisions of the peri-urban concept. According to Ferguson (2007), the chaos of the peri-urban has recently come to be seen in a much more positive light. Instead of being tainted by pejorative notions of slums, illegality and disorder, peri-urban actors are now seen as 'micro-entrepreneurs' imbued with inventive creativity. The informal sector is increasingly envisaged as a dynamic form of enterprise and of job creation. Shacks and slums are no longer conceptualised as signs of poverty, instead they are symbols of potential. These neoliberal conceptualisations of local empowerment – or put differently, narratives of economic capacity, resources and opportunities – obscure questions of structure, agency, power and politics. As the peri-urban becomes constructed as a place of 'hope and possibility' or as 'sites of development' in the global discourse, rather than 'proof of development's failure' (Ferguson 2007: 75) it is more crucial than ever that research examines questions of Sustainability and social justice. Understanding these must be from the perspective of the poor and must seek to understand the interrelated – and often contradictory – need to achieve Sustainability across various domains: including the interrelated nature of the urban and the peri-urban environments and the interconnections between environmental, human and agricultural systems. The extent to which the poor can, however, assert their visions and perspective is, as the following section demonstrates, often limited.

PEOPLE'S PARTICIPATION IN DECISION MAKING IN THE URBAN CONTEXT

People's participation in decision making has been a popular catchphrase over the past two decades. According to Cornwall and Coelho (2007), governance reforms have generated a profusion of 'spaces' for citizen engagement. These hybrid 'new democratic spaces' are intermediate, situated at the interface between the state and society; they are also conduits for negotiation, information and exchange (ibid).

The historical development of people's participation has largely been within two sectors, agriculture and rural development, and public health (Cernea 1992). In the urban context, initiatives for people's participation emerged in the 1990s. This appears to be linked with the emergence of a new model of participatory governance during the era of state reforms, marked by the legal institutions of participation.

LEGAL INSTITUTIONS OF PARTICIPATION

All but 12 of the 75 developing countries with more than five million inhabitants have implemented some form of decentralisation, associated with varying degrees of participation, associated financial and political power. The popular reforms promised wider participation of citizens at the local level. Parallel to these developments, enabling legal frameworks and institutional channels for citizen participation at the local level have been developed in many of these countries (Gaventa and Valderrama 1999: 5).

Democratic decentralisation – designed in part to facilitate greater citizen participation in governance through institutionalised channels (Diamond 2004; Oxhorn 2001) – has been understood as the transfer of resources and power (and often of tasks) to lower-level authorities which are largely or wholly independent of higher levels of government and which are democratic in some way and to some degree (Manor 1997: 6-7) and where persons in authority within institutions at intermediate and/or local levels are elected directly or indirectly by secret ballots.

The international donor community and national governments has begun to pay attention to people's participation, along with related issues such as good governance and democracy. This is because donors and governments recognise that their modernist model of development will not be embraced and consolidated until effective demand is articulated by the relevant sections of the society. Milton and Thomson argue that donors and states perceive democratic participation as part of a broader process of structural reforms, the shift towards market oriented economies, and the decentralisation and privatisation of public services. In addition to participation in national elections and planning, the concept also involves people's participation in the delivery of services that were previously the responsibility of the state. They suggest that participation in development is little more than a cost cutting strategy aimed at placing greater responsibilities onto local communities while reducing external support (Milton and Thompson 1995: 232).

Milton and Thomson's presumption is well manifested by closely examining the experiences of decentralised governance in several countries. In Latin America, in examining the degree to which decentralisation offers a space for more democratic participation at the grassroots, Schönwalder (1997: 755) argues that not enough attention was paid to the question of power. In fact, local elites, local governments and other actors operating on the local scene, such as political parties and even some NGOs, have often been prone to co-opt popular movements in order to further their own agendas. In Tanzania, Mukandala (1998) has found that decisions over who should participate in the Ward Development Committees (WDC) - the lowest local level decision-making bodies which approve requests

before being forwarded to higher levels in the district - hindered their effectiveness in achieving high levels of popular participation in decision-making. Although the norms state that the majority of the positions are for community representatives, in some districts prominent government officers invited influential people when important decisions were made. Similarly, in Delhi, by overruling the provision of 74th amendment, the Government has constituted a new form of citizen's participation, popularly known as 'Bhagidhari'. Bhagidhari is mainly represented by the privileged citizens, who have close links with the ruling political party (Hazards Centre 2007). Thus, whilst there are provisions for citizen's participation in decision making, these provisions do not necessarily ensure participation of people at the grass roots.

ALTERNATIVE FORMS OF PARTICIPATION

Alternative forms of citizen's participations have emerged in the cities of many developing countries, due to the failure of conventional legal and democratic institutions to ensure participation in decision making. With the opening up of current policy processes and exploring areas of contestation, with the view to understanding how these diverse framings might facilitate – or hinder – the development of more socially just decision-making processes as a core focus of the current STEPS peri-urban, lessons from elsewhere in terms of alternative forms of citizen participation in urban planning provide some valuable insights.

One of the most successful experiences is that of 'participatory budgets' in Brazil. At least 70 cities have established a participatory budget system which allows citizen participation in decision-making over allocation of resources. The participatory budget strategy was initiated in 1989 when the City Hall of Porto Alegre created participatory structures with decision-making power over the allocation of resources for the development of the municipality. The Municipal Council of Government Plan and Budget (MCGPB) is responsible for the co-ordination and organisation of the process of developing the investment plan, and checking the execution of the planned budget. It is constituted by elected citizens from the 16 regions in which the city is divided as well as by government representatives with no voting rights. Through a participatory planning process involving people from all the regions, the investment plan of the previous year is reviewed, priorities are defined and councilors for the MCGPB are elected. An open and elaborate consultation process with the population follows, which ends when the investment plan is approved by the MCGBP and sent by the Executive Power to the Municipal town councilors. Subsequently a negotiation process takes place around the specific details (Gaventa and Valderrama 1999: 11).

In Peru there is an initiative in citizen participation called *Mesas de Concertación en contra la Pobreza*. The origin of these Mesas lies in the early 1990s when they emerged among community groups as a means of mobilising local energies to combat food and other shortages in Lima and elsewhere. With the fall of Fujimori in 2000, the transition government passed a law that made the Mesas de Concertación a constitutional requirement. By law, Mesas have to be established in every province of the country, with one for the metropolitan area of Lima. Each Mesa has a council made up of representatives of government, of NGOs, of the churches and of community organisations. There is a national Mesa to coordinate the work of the provincial ones. The tasks of the Mesas are to formulate short, medium and long-term priorities for community development in terms of urban or rural infrastructure, health and educational services, security, recreation and job creation. The short-term priorities are, in effect, an executive plan for the following year. In the case of Lima, these plans are formulated through working-groups created at the municipal and *cono* (district made up of several municipalities) level. Community organisations discuss their priorities and elect representatives to attend the meetings. The priorities of the various districts and conos are reconciled at meetings at the metropolitan level. Once the strategic plans are finalised, they are passed to Congress and to the appropriate government departments (Roberts 2005).

More recently, there has been an increased interest in drawing on participatory methodologies developed within a rural context for urban work. As with the use of such approaches in a rural development context, there is a significant distinction between participatory approaches being used to simply obtain information from the community[12] and such tools being used to initiate a development process within the community. In the latter case, information gathering is very much a first step designed to demonstrate to community members the depth of their knowledge and their capacity to analyse such information (Milton and Thompson 1995: 241).

In a joint initiative between the People's Dialogue in South Africa, the recently-formed South African Homeless People's Federation and three Indian organizations, namely SPARC, the National Slum Dwellers Federation and *Mahila Milan*, community exchanges have been combined with participatory

[12]When using these techniques to reveal and analyze local people's knowledge, the exercises are completed once that information is obtained and there is no further discussion of problems and opportunities facing the community. In this form, it is essentially rapid urban appraisal as analogous to Rapid Rural Appraisal, rather than participatory urban appraisal. While some participatory approaches have clearly drawn on traditions developed in other sectors, particularly PRA and RAP, it is also evident that there has been widespread experimentation with different participatory approaches by groups working in urban areas. In many aspects, similar tools and techniques have been developed based around the use of diagrams, maps and pictures to replace written descriptions (Milton and Thompson 1995: 241).

methodologies in order to 'root' the learning process even more solidly within the communities and to rapidly accelerate community leaders' and members' capacity to adopt new roles within the development process. This collaboration has meant that the People's Dialogue members have been able to learn from community-based shelter training programmes in India where the National Slum Dwellers Federation and *Mahila Milan* have been engaged in such programmes for over eight years. They have since experimented with and developed the training process within communities in South Africa. In this process, they have explored the potential of South-South community exchanges to transform the capacity of local groups to address their own development needs (ibid: 245-246). Some of the other better known examples include:

• In Fortaleza, Brazil, NGOs have worked with low-income community groups to collectively redesign houses and settlements.

• In Manila, the Philippines, women have been exploring critical events in the development of settlement through sharing life histories.

• In Chile, houses have been designed by non-specialists using house modelling exercises.

• In Pakistan, the Orangi Pilot Project makes rapid and low cost surveys of areas that are to be provided with secondary drains by drawing on the community's expertise.

• In Zambia, PRA methodologies have been used to identify appropriate donor support for income generation projects in Lusaka.

• In Guinea, FAO have developed a programme of support for artisanal fisheries both improving local opportunities and changing national policies.

While a number of participatory methods focus on enhancing direct participation of citizens in the governance process, others are focusing on maintaining accountability of elected officials and government agencies to the citizenry. Traditionally, in democratic governance, accountability is thought to be maintained in a number of ways, e.g. local elections, strong and active opposition parties, media, public meetings and formal redress procedures (Blair 1998). In the newer and more active forms of citizenship, citizens are developing other accountability mechanisms. In Rajasthan (India), for instance, as the work by Goetz and Jenkins (1999) documents, the women led right-to-information movement has demanded a minimal level of transparency by local governments, especially in the use of local funds. Other more professional advocacy organisations, such as the Public Affairs Centre in Bangalore (India), have used relatively sophisticated research processes to develop Report Cards of local governments in the delivery of services.

What is apparent from these case studies is that the institutional form of people's participation can be created by the state to foster its own agenda. In other words, the state successfully utilises the legal institution of participation for obtaining support from people who resonate their voices with the voice of state. But it has been witnessed that in many developing countries the institutional form of participation has failed to ensure the real participation of marginalised people. It is due to the failure of conventional democracy and legal institutional spaces of participation that many alternative spaces of participation have emerged. These alternative spaces of participation have, up to an extent, proved to be successful in addressing the development needs of community.

EMERGING POLICIES AND PRACTICES IN INDIAN CITIES

Since 1991, in tune with the neo-liberal imperative, Indian cities have been experiencing a massive restructuring of their economic, physical and social worlds. Neo-liberal economic policies are perceived to have been guided by the International Monetary Fund and the World Bank through their Structural Adjustment Programmes (See Bhaduri and Nayyar 1996; Stiglitz 2002). The crucial aspect of neo-liberal restructuring involves the 'opening' up of the economy along three important avenues: international trade, international investment and international finance. Neo-liberalism has provided a kind of operating framework for competitive globalisation, inspiring and imposing far-reaching programs for economic restructuring and rescaling across a wide range of national and local contexts (Patnaik 2003). In the process, industrial economy is being transformed into service and business based economy. Land and real estate is becoming a dominant sector of profit-making, while the 'unprofitable' and the 'undesirable' are being massively displaced. Slums are being razed down, and the homeless people and beggars are being driven out of the cities. Footpaths, parks and a whole range of public spaces are increasingly being made out of bounds to the general public. There is a general escalation in the cost of living in the cities due to privatisation of the most basic services including electricity, water, sanitation, transport, education and health. As a result, the disparity between the various social classes inhabiting the city is rapidly increasing.

However, there is a constitutional provision to democratise the process of decision making. The 74th Constitutional Amendment Act (CAA), adopted in 1992 by the Indian Parliament, is a historic piece of legislation which promotes democratisation of urban local bodies in a double sense: as extension and as inclusion (Lama-Rewal 2007: 51). The 74th amendment of the Constitution ensures greater participation of people at grass roots level in the decision making, but that the institutional and social context in which the implementation of the 74th CAA

took place has severely limited the impact of the democratisation of municipal corporations (Hazards Centre 2007). It is also argued that the institutional form of people's participation has been created by the state to foster its own agenda of structural adjustment. In other words, the state successfully utilises the legal institution of participation for obtaining support from people, who resonate their voices with the voice of state (Milton and Thompson 1995: 232).

Along with the process of urban restructuring and democratisation of decision making, some of the prominent alliances that have emerged are the Human Rights Law Network (www.hrln.org), National Alliance of People's Movement (NAPM), The Society for the Promotion of Area Resource Centers (SPARC), National Federation of Slum Dwellers (NFSD), Mahila Milan, and Delhi based Janwadi Adhikar Manch and Sajha Manch (see Appendix One for background information on these organisations). These have the sole agenda of representing the voices of the poor in decision-making. The NAPM, for example, is a coming together of like-minded groups and movements who, while retaining their autonomous identities, are working together to bring the struggle for a people-oriented development model to the centre-stage of politics and public life. NAPM brings together struggles of various marginalised sectors into an inter-sectoral alliance which asserts the primacy of natural resources ownership to communities who live and sustain by those resources. The bringing together of these traditional communities also brings with it a new politics of natural resource ownership and control. It is understood that such an alliance, emerging with a definite ideological commonality and common strategy, can give rise to a strong social, political force and a national people's movement. Whilst initial work was focussed in rural areas, NAPM has been actively waging a struggle against the demolition of informal settlements in several Indian cities, especially Mumbai and Delhi in recent years.

The roles of each member of the Alliance are clearly defined. The NSDF organises and mobilises the urban poor and negotiates with resource providing institutions; Mahila Milan supports and trains women's collectives to administer and manage their community's resources and participate in NSDF activities; and SPARC provides the administrative, financial, policy, documentation and other support necessary for these processes to be successful on the ground. The Alliance recognises that the urban poor in most cities have inadequate access to housing and infrastructure. Therefore the Alliance's immediate aim is to create the institutional arrangements necessary for large numbers of poor people to access housing and infrastructure. Its long-term vision is to support a process where organised groups of the urban poor can participate in making decisions about how their cities are developed and managed (SPARC 2008).

Similarly, Sajha Manch is an alliance of 40 organisations comprising NGOs, CBOs, trade unions, academics and individuals working on issues of informal settlement in Delhi which came together in 1999. In Delhi, Sajha Manch attempts to document, critique and oppose all such processes that seek to undermine

the rights of 70 per cent of the city's inhabitants who live on pavements, slums, 'unauthorised' colonies and resettlement colonies, and work in the informal sector. The alliance challenges the dominant judicial and administrative forces that aim to make the city an exclusive 'world-class' space, at the cost of displacing the working poor from their homes and work. The members of the alliance collectively research, campaign and advocate for pro-poor perspectives and practices on urban policy and planning, including issues of land tenure, housing, health, sanitation, water, transport, electricity, environment, education, governance and livelihoods (Hazards Centre 2007).

Thus, we can see that, in recent history, Indian cities have been witness to a number of alliances on a variety of grounds. The most prominent issue has been the shelter of marginalised people mainly residing in the informal settlements. While analysing the emergence of alliances and social movements in the context of Delhi, Kumar argues that there has been change from 'social movements' to 'new social movements', which has been largely the result of certain conditions created by the dynamism of development: (1) newer forms of discontent have evolved; (2) newer subjectivities have emerged which could not be located by established oppositional forces, which also function within dominant discourse parameters, because of their marginal location in the meta-narrative of hegemony and domination; (3) the nature of discontentment as well as work ethics and values have changed whether it is the desperation to earn a living or for material extravagance, thereby necessitating a new form of mobilisation; and (4) newer forms of responses have failed to reciprocate the changes, leaving the masses in a political vacuum (Kumar 2008: 88-89). Thus, these alliances have achieved success in terms of creating an alternative space in society for the marginalised; but they have simultaneously and ironically failed in terms of achieving any long-term adaptive mechanism for incorporating the perspectives of the poor into decision making processes. The extent to which alliances, NGOs, CBOs and other actors are able to prioritise poor people's agendas and shape accompanying policy is not clearly determined. It is through framings and pathways that the STEPs project will investigate this gap.

CONCLUSIONS: PERI-URBAN SUSTAINABILITY

This paper has shown that environmental degradation, natural resource conflicts, health concerns and social injustice are particularly acute in the peri-urban situation and has explored some of the reasons why this is the case. Failure to address these apparently peripheral issues not only results in a plethora of missed opportunities to benefit from rural-urban synergies (for example in waste management and affordable and nutritious fresh produce) but also fails to address a key flash point in undermining the ability to improve environmental integrity and social equity and poverty in growing cities. However, deeper insight into these peripheries, which are subject to ambiguity, informality and illegality in the context of formal planning processes, can elucidate alternatives to dominant planning and management trajectories.

As we have illustrated in the fields of water, health and agriculture, dominant planning and formal management decisions are often based on particular framings, inadequate information and limited recognition of peri-urban dynamics. Priorities are set largely on the basis of economic growth parameters and under the influence of a limited number of powerful urban interest groups. Service provision to formal housing and industrial developments is prioritised, and management decisions are made on the basis of acquiring resources and controlling known risks to disruption of supply or quality. But alternative plans based on other perspectives, such as practices on the ground, resource conflicts, entitlements, interactions between health-water and agriculture, and the differing impacts of technologies in these diverse and rapidly changing environments are generally ignored. In the meantime, many people who are not served by the formal system adopt informal coping strategies, and these may result in a worsening situation of marginalisation and environmental degradation or may be potential new pathways to Sustainability. The implications of current formal interventions are not well understood, and there is little adaptive capacity to respond to emerging shocks or stresses which will impact on the urban-peri-urban-rural continuum.

It is clear that lessons are to be learnt from the successes and failures of initiatives to engage the poor and to seek social justice in the face of the exclusionary urbanisation process that is occurring in many developing country cities. With the emerging recognition of links between livelihoods, environment and health in peri-urban areas, useful case studies are beginning to emerge here too. But notions of Sustainability are generally missing from peri-urban debates, and in linking with policy and practice, ‘pro-poor’ initiatives are rarely coupled with ‘pro-environment’ initiatives. The issue of slum relocation in India is an interesting example of this, where increasing polarisation can be seen. Ultimately, however, this paper argues that it is precisely because of the unclear regulatory status of the peri-urban, its dynamic nature of flows and its heterogeneous and rapidly changing composition, that it is vital to introduce notions of Sustainability – which

seek to address normative concerns of social justice and to ensure environmental continuity. The peri-urban is frequently negatively juxtaposed to both the urban and rural, which receive far more attention from policy makers and development agencies, rather than being considered in terms of its potential to enhance rural-urban synergies and build Sustainability. It is thus necessary to challenge these understandings of the peri-urban through attention to sustaining aspirations to progressive improvements in human wellbeing and environmental integrity.

There is thus a need to build upon and complement previous and ongoing research that seeks to understand the dynamism of the peri-urban interface and its relationships with the wider landscape. However, it is also essential to integrate this with an understanding of the framings, power relations and governance structures; while exploring the dynamic interlinkages between different 'systems'; and to show how these processes collectively determine particular technological interventions and management outcomes for the peri-urban. It follows then that dialogue around these issues can be promoted between diverse actors involved in different aspects of peri-urban management, and in so doing, opportunities for stakeholders to explore alternative decision-making processes and implications of alternative outcomes can be created.

A promising means of approaching this is through empirical studies initially focussed on specific resource management issues of major concern, such as water access or pollution impacts in and around case study cities. These issues affect marginalised communities most severely, but are also of significant concern to other stakeholders. We propose that by using these case studies as an 'entry point' for dialogue, it is possible to begin to reconceptualise the peri-urban and to develop a shared understanding of peri-urban challenges and implications of current actions, not only for the direct benefit of the peri-urban, but for the adjacent cities and rural hinterland. Ultimately this should help to facilitate the development of policy and management approaches that address the needs of poor and marginalised communities, whilst also improving resource management and environmental integrity.

APPENDIX ONE

The Human Rights Law Network (HRLN) is a collective of lawyers and social activists dedicated to the use of the legal system to advance human rights, struggle against violations, and ensure access to justice for all. A not-for-profit, non-governmental organisation, HRLN defines rights to include civil and political rights as well as economic, social, cultural and environmental rights. They believe human rights are universal and indivisible, and their realisation is an immediate goal. Starting in 1989 as an informal group of lawyers and social activists, HRLN has evolved into a human rights organisation with an active presence in many states of India. The organisation provides pro bono legal services to those with little or no access to the justice system. It participates in the struggle for rights through its various activities including public interest litigation, advocacy, legal awareness programmes, investigations into violations, publishing 'know your rights' materials, and participating in campaigns. HRLN collaborates with social movements, human rights organisations, and grass-roots development groups to enforce the rights of children, dalits, people with disabilities, farmers, HIV positive people, the homeless, indigenous peoples, prisoners, refugees, religious and sexual minorities, women, and workers, among others. HRLN views the legal system as a limited but crucial instrument for realising human rights. They believe that large scale struggles against human rights violations have to be waged by social and political movements, and that the legal system can play a significant supportive role in these struggles (www.hrln.org).

The National Alliance of People's Movements (NAPM) is a network of over two hundred people's movements in India with a clear ideology against corporate globalisation, religious fundamentalism, discrimination of any kind and struggling for people's right over natural resources, for true internationalism and for a just and egalitarian society. The Organisation has both short term and long term goals. While it plans to turn around the development paradigm in the long run for an equitable, gender just and participatory development, in the short term it aims to bring justice to those groups affected by the present socio – political system and ensure more voice and visibility to their struggles in various national and international forums. It uses mass mobilisation along with advocacy lobbying and networking with likeminded groups to achieve these ends. NAPM in its organisational form tries to integrate not only sections of marginalised communities but also their supporters with individual membership. It attempts to link between the struggling rural masses, urban civil society, labourers, students and intelligentsia. Within its structure, it aims at a democratic functioning and also consensus-based decision making. Sharing of resources and access to relevant governmental and non- governmental resources has been one of the prime features of this network with organisations with more experience and resources helping newer struggles to break new paths (NAPM 2008).

The Society for the Promotion of Area Resource Centers (SPARC) is one of the largest Indian NGOs working on housing and infrastructure issues for the urban poor. In 1984, when SPARC was formed, it began working with the most vulnerable and invisible of Mumbai's urban poor - the pavement dwellers. SPARC's philosophy is that 'if we can develop solutions that work for the poorest and most marginalised in the city, then these solutions can be scaled up to work for other groups of the urban poor across the country and internationally'. Since 1986, SPARC has been working in partnership with two community-based organisations: the National Slum Dwellers Federation and Mahila Milan. Together, they are known as the Alliance. Today, the Alliance works in about 70 cities in the country and has networks in about 20 countries internationally (SPARC 2008).

The National Slum Dwellers Federation (NSDF) was founded in the mid 1970s and is a national organisation of community groups and leaders who live in slums/ informal settlements across India. Its main aim is to mobilise the urban poor to come together, articulate their concerns and find solutions to the problems they face. Today the NSDF works with about half a million households in the country.

Mahila Milan means "Women Together" in Hindi and is a decentralised network of poor women's collectives that manage credit and savings activities in their communities. Mahila Milan aims to provide a space for women to take on important decision making roles and be recognised for their critical contributions towards improving the lives of their communities. Mahila Milan was initiated in 1986 when 500 women who lived on Mumbai's pavements organised themselves to successfully prevent the demolitions of their homes. Today, Mahila Milan has given out tens of thousands of loans to poor women all across the country and has collected savings worth several millions of rupees (SPARC 2008).

The Delhi Janwadi Adhikar Manch (DJAM) was formed on 16 December 1996, when various organisations came together to address issues arising from a series of Supreme Court orders relocating polluting industries and cleaning up Delhi. They had two issues before them: (1) the dislocation of thousands of working class families due to the closure of factories, and (2) the demolition of slums and the consequent displacement of those living in them. So far, the DJAM has been engaged in organising protest demonstration at the Supreme Court, Labour Ministry, etc; holding public meetings on the issue in various industrial areas; campaigning against the Supreme Court order through the distribution of thousands of leaflets, cultural programmes and rallies; mobilising opinion in universities, the media and the public at large through literature, discussions and public meetings; joining the struggle of slum dwellers against the ongoing demolition drive (South Asia Forum for Human Rights 2008). However, the DJAM alliance no longer exists, but its associated members continue to work towards resolving the above issues.

REFERENCES

Agrawal, M., Singh, B., Rajput, M. and Marshall, F. (2003) 'Effect of Air Pollution on Peri-Urban Agriculture: A Case Study', *Environmental Pollution,* 126: 323-329

Akhtar, S., White, F., Hasan, R., Rozi, S., Younus, M. and Ahmed, F. (2007) 'Hyperendemic Pulmonary Tuberculosis in Peri-urban Areas of Karachi, Pakistan', *BMC Public Health,* 7:70

Allen, A. (2003) 'Environmental Planning and Management of Peri-urban Interface: Perspective on an Emerging Field', *Environment and Urbanization*, 15.1: 135-148

Allen, A. and Dávila, J. D. (2002) 'Mind the Gap: Bridging the Rural-urban Divide', *ID21 Insights 45,* Brighton: Institute of Development Studies

Allen, A., Dávila, J. D. and Hofmann, P. (2006a) *Governance of Water and Sanitation Services for the Peri-urban Poor: A Framework for Understanding and Action in Metropolitan Regions,* Development Planning Unit, London: University College

Allen, A., Dávila, J. D. and Hofmann, P. (2006b) 'The Peri-urban Water Poor: Citizens or Consumers?' *Environment and Urbanization,* 18.2: 333-351

Appadurai, A. (2002) 'Deep Democracy: Urban Governmentality and the Horizon of Politics, *Public Culture,* 14.1: 21-47

Arabindoo, P. (2005) 'Examining the Peri-Urban Interface as a Constructed Primordialism', in Dupont, V. (ed.), *Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises. A Review of Concepts and General Issues,* New Delhi: Centre de Sciences Humaines

Arabindoo, P. (2006) 'Neighbourhood Transformations in Peri-Urban Chennai', in Dupont, V. and N. Sridharan (ed.), *Peri-Urban Dynamics: Case Studies in Chennai, Hyderabad and Mumbai,* CHS Occasional Paper No. 17, New Delhi: Centre de Sciences Humaines

Bakker, N., Dubelling, M., Gundel, S., Sabel-Koschella, U. and Zeeuw, de H. (ed.). (2000) *Growing Cities, Growing Food: Urban Agriculture on the Policy Agenda,* Feldafing: DSE

Banerjee-Guha, S. (2002) 'Shifting Cities: Urban Restructuring in Mumbai', *Economic and Political Weekly,* January 12: 121-127

Baviskar, A. (2002) 'The Politics of the City', *Seminar,* 516: 40-42

Baviskar, A. (ed.). (2006) *Waterscapes: The Cultural Politics of a Natural Resource,* Delhi: Permanent Black

Beaglehole, R., Ebrahim, S., Reddy, S., Voute, J. and Leeder, S. (2007) 'Prevention of Chronic Diseases: A Call to Action', *Lancet,* 22.370(9605): 2152-7

Bhaduri, A. and Nayyar, D. (1996) *The Intelligent Person Guide to Liberalisation,* New Delhi: Penguin Books India (P) Ltd.

Birley, M. and Lock, K. (1998) 'Health and Peri-urban Natural Resource Production', *Environment and Urbanization,* 10.1: 89-106

Black, M. and Hall, A. (2004) 'Pro-Poor Water Governance', in *Water and Poverty: The Themes,* by the Asian Development Bank, Kyoto, Japan: ADB

Black, M. and Fawcett, B. (2008) *The Last Taboo: Opening the Door on the Global Sanitation Crisis,* London: Earthscan

Blair, H. (1998) *Spreading Power to the Periphery: A USAID Assessment of Democratic Local Governance,* available at: http://pdf.usaid.gov/pdf_docs/PNACA904.pdf , accessed 02 September 2009

Bloom, G., Standing, H. and Lloyd, R. (2008) 'Markets, Information Asymmetry and Health Care: Towards New Social Contracts', *Social Science and Medicine,* 66.10: 1-12

Bowyer-Bower, T. (2006) 'The Inevitable Illusiveness of Sustainability in the Peri-urban Interface: The Case of Harare', in *The Peri-urban Interface – Approaches to Sustainable Natural and Human Resource Management,* London and Sterling (VA): Earthscan

Bradford, A., Brook, R. and Hunshal, C. S. (2003) 'Wastewater Irrigation in Hubli–Dharwad, India: Implications for Health and Livelihoods', *Environment and Urbanization,* 15.2: 157-170

Briggs, J. (1991) 'The Peri-urban Zone of Dar es Salaam, Tanzania: Recent Trends and Changes in Agricultural Land Use', *Transactions of the Institute of British Geographers,* 16.3: 319-331

Brook, R. M. and Davila, J. D. (2000) *The Peri-urban Interface: A Tale of Two Cities,* London: University of Wales

Bunting, S. W. and Lewins, R. (2006) *Urban and Peri-urban Aquaculture Development in Bangladesh and West Bengal,* India, Centre for Environment and Society Occasional Paper 2006-2, Colchester: University of Essex

Burte, H. and Krishnankutty, M. (2006) 'On the Edge: Planning, Describing and Imagining the Seaside Edge of Mumbai, in Dupont, V. and Sridharan, N. (ed.), *Peri-Urban Dynamics: Case Studies in Chennai, Hyderabad and Mumbai,* CHS Occasional Paper No. 17, New Delhi: Centre de Sciences Humaines

Butterworth, J., Ducrot, R., Faysse, N. and Janakrajan, S. (2007) *Peri-urban Water Conflicts: Supporting Dialogue and Negotiation,* Technical Paper Series No. 50, Netherland: IRC International Water and Sanitation Centre

Cadène, P. (2005) 'Dynamics of Peri-Urban Areas: From the French Case to the Developing Countries', in Dupont, V. (ed.), *Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises. A Review of Concepts and General Issues,* New Delhi: Centre de Sciences Humaines

Cernea, M. M. (1992) 'Re-tooling in Applied Social Investigation for Development Planning: Some Methodological Issues', in Scrimshaw, N. S. and Gary, R. G. (ed.), *RAP: Rapid Assessment Procedures, Qualitative Methodologies for Planning and Evaluation of Health Related Programmes,* Nencel: International Nutrition Foundation for Development Countries

Chadha, V. K., Suryanarayana, H. V., Krishnamurthy, M. K., Jaganath, P. S. and Shashidhara, A. N. (1997) 'Prevalence of Undernutrition Among Peri-Urban Children and its Influence on the Estimation of Annual Risk of Tuberculosis Infection', *Indian Journal of Tuberculosis,* 44.4: 67-71

Chatterjee, P. (2003) 'Are Indian Cities Becoming Bourgeois at Last?' in Chanderasekhar, I. and Seel, P. C. (ed.) *Body City - Sitting Contemporary Culture in India,* Delhi: Tulika Books

Clasen, T., Schmidt, W., Rabie, T., Roberts, I. and Cairncross, S. (2007) 'Interventions to Improve Water Quality for Preventing Diarrhoea: Systematic Review and Meta-analysis' *British Medical Journal,* 334.7597: 782

Cornwall, A. and Coelho, V. S. (ed.). (2007) *Spaces for Change? The Politics of Citizen Participation in New Democratic Arenas,* London and New York: Zed Books

Dahiya, B. (2003) 'Peri-urban Environments and Community Driven Development: Chennai, India', *Cities,* 20.5: 341-352

Davis, M. (2004) 'Planet of Slums', *New Left Review,* 26, March - April

Diamond, L. (2004) *The Imperative of Good, Democratic Governance,* Washington, DC: Center for International Private Enterprise, available at www.cipe.org/pdf/publications/fs/FS_Diamond.pdf, accessed 02 September 2009

Dick, H. W. and Rimmer, P. J. (1998) 'Beyond the Third World City: The New Geography of South East Asia', *Urban Studies,* 35(12): 2303-2321.

Douglas, I. (2008) 'Environmental Change in Peri-Urban Areas and Human and Ecosystem Health', *Geography Compass,* 2.4: 1095–1137

Dubash, K. N. (2002) *Tubewell Capitalism: Groundwater Development and Agrarian Change in Gujarat,* Delhi: Oxford University Press

Dupont, V. (2005) 'Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises: An Introduction', in Dupont, V. (ed.), *Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises.* A Review of Concepts and General Issues, New Delhi: Centre de Sciences Humaines

Ebrahim, S. and Smeeth, L. (2005) 'Non-communicable Diseases in Low and Middle-income Countries: A Priority or a Distraction?' *International Journal of Epidemiology,* 34.5: 961-966

FAO (2007) *Coping with Water Scarcity - Challenge of the Twenty-first Century,* available at: http://www.fao.org/nr/water/docs/escarcity.pdf, accessed 02 September 2009

Ferguson, J. (2007) *'Formalities of Poverty: Thinking about Social Assistance in Neoliberal South Africa',* African Studies Review, 50.2: 71-86

Fernandes, L. (2004) 'The Politics of Forgetting: Class Politics, State Power and the Restructuring of Urban Space in India', *Urban Studies,* 41.12: 2415-2430

Friedberg, S. (2001) 'Gardening on the Edge: The Social Conditions of Unsustainability on an African Urban Periphery', *Annals of the Association of American Geographers,* 91.2: 349-369

Gandy, M. (2006) *Water Sanitation and the Modern City: Colonial and Post-colonial Experiences in Lagos and Mumbai,* Occasional Paper, Human Development Report 2006, UNDP

Gaventa, J. and Valderrama, C. (1999) 'Participation, Citizenship and Local Governance', background note prepared for workshop on strengthening participation in local governance, Brighton: Institute of Development Studies, June 21-24

Geissler, W. (2008) *Second Enclosure: The Changing Spaces of Medical Research in 21st Century Kenya,* STEPS Centre Seminar 6 May 2008, SPRU, Brighton: University of Sussex

Ghosh, R. and Bharati, P. (2005) 'Effect of Working Patterns on Women's Health in Two Ethnic Groups in a Peri-urban Area of Kolkata City, India', *Ecology of Food and Nutrition,* 44.3: 189-206

Goetz, A. M. and Jenkins, R. (1999) 'Accounts and Accountability: Theoretical Implications of the Right to Information Movement in India', *Third World Quarterly,* 20: 589-608

Guyer, J. (2004) *Marginal Gains: Monetary Transactions in Atlantic Africa,* Chicago: University of Chicago Press

Halkatti, M., Purushothaman, S. and Brook, R. (2003) 'Participatory Action Planning in the Peri-Urban Interface: the Twin City Experience, Hubli-Dharwad, India', *Environment and Urbanization,* 15.1: 149-158

Harvey, D. (1989) 'From Managerialism to Entrepreneuralism: The Transformation in Urban Governance in Late Capitalism', *Goegrafiska Annaler,* Series B, Human Geography, 71.1: 3-17

Hazards Centre (2004) *Yeh Delli Kiski Hai?* New Delhi: Hazards Centre

Hazards Centre (2007) *Government by the People by the People by the People: Analysing 74th Constitutional Amendment Act 1992,* New Delhi: Hazards Centre

Heynen, N., Kaika, M. and Swyngedouw, E. (2006), 'Urban Political Ecology: Politicising the Production of Urban Natures' in Heynen, N., Kaika, M. and Swyngedouw, E. (ed.), *In the Nature of Cities: Urban Political Ecology and the Politics of Urban Metabolism,* London: Routledge

Hofmann, P. (2005) *The challenges of Urban Waste Use as a Means to Enhance the Livelihoods of Peri-urban Poor People,* output from a project funded by the UK Department for International Development (DFID) for the benefit of developing countries, Development Planning Unit: University of London

Iaquinta, D. L. and Drescher, A. W. (2000) *Defining Peri-urban: Understanding Rural Urban Linkages and Their Connection to Institutional Contexts,* Partnership Programme of the Food and Agriculture Organization of the United Nations (FAO)

Jaiswal, A., Singh, V., Ogden, J. A., Porter, J. D. H., Sharma, P. P., Sarin, R., Arora, V. K. and Jain, R. C. (2003) 'Adherence to Tuberculosis Treatment: Lessons from the Urban Setting of Delhi, India', *Tropical Medicine and International Health,* 8.7: 625–633

Jargowsky, P. A. (2005) 'Comparative Metropolitan Development' in Dupont, V. (ed.), *Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises. A Review of Concepts and General Issues,* New Delhi: Centre de Sciences Humaines

Kamat, V. R. and Nichter, M. (1998) 'Pharmacies, Self-medication and Pharmaceutical Marketing in Bombay, India', *Social Science & Medicine,* 47:779-794

Kelly, P. F. (2006) 'The Politics of Urban-rural Relations: Land Use Conversion in the Philippines' in Tacoli, C. (ed.), *Rural-Urban Linkages,* London: Earthscan

Kennedy, L. (2007) 'Regional Industrial Policies Driving Peri-Urban Dynamics in Hyderabad, India', *Cities,* 24.2: 95-109

Kielman, K. (2002) 'Theorizing Health in the Context of Transition: The Dynamics of Perceived Morbidity among Women in Peri-Urban Maharashtra, India', *Medical Anthropology,* 21.2: 157-205

Kielman, K. and Bentley, M. (2003) 'Thresholds of Morbidity among Women in a Peri-urban Community of Maharashtra, India: Conceptual and Methodological Issues', *Journal of Health Psychology,* 8.5: 525 – 538.

Kumar, R. (2008) 'Globalization and Changing Patterns of Mobilization in Urban India', *Journal of Social, Cultural and Political Protest,* 7.11: 77-96

Lama-Rewal, S. T. (2007) 'Neighbourhood Associations and Local Democracy: Delhi Municipal Elections 2007', *Economic and Political Weekly,* November 24: 51-60

Leach, M., Scoones, I. and Stirling, A. (2007) Pathways to Sustainability: *An Overview of the STEPS Centre Approach,* STEPS Approach Paper, Brighton: STEPS Centre

Leclerc, E. and Bourguignon, C. (2006) 'Defining the Urban Fringe through Population Mobility: The Case of Madhapur and its Information Technology Park (HITEC CITY – HYDERABAD)', in Dupont, V. and N. Sridharan (ed.), *Peri-Urban Dynamics: Case Studies in Chennai, Hyderabad and Mumbai,* CHS Occasional Paper No. 17, New Delhi: Centre de Sciences Humaines

Lee-smith, D. (2008) 'Urban Food Production in Kampala' in *Healthy City Harvest: Generating Evidence to guide Policy ion Urban Agriculture,* Lima and Peru: CIP/Urban Harvest and Makerere University Press

Lintelo, D. T., Marshall, F. and Bhupal, D. S. (2002) 'Urban Food: The Role of Urban and Peri-urban Agriculture in India: A Case Study from Delhi', *Food, Nutrition and Agriculture,* 29 FAO: 4-13

Manor, J. (1997) *The Political Economy of Decentralisation,* World Bank

Maria, A. (2006) 'The Role of Groundwater in Delhi's Water Supply: Interaction between Formal and Informal Development of the Water System, and Possible Scenarios of Evolution', in Tellam, J. H., Rivett, M. O., Israfilov, R. J. and Herringshaw. L. G. (eds.) *Urban Groundwater Management and Sustainability,* The Netherlands: Springer

Marshall, F. M., Ashmore, M. R. and Hinchcliffe, F. (1997) *A Hidden Threat to Food Production: Air Pollution and Agriculture in the Developing World,* Gatekeeper Series no. SA73, London: International Institute for Environment and Development

Marshall, F. M., Bell, J. N. B., Stonehouse, J., Wildig, Z., Agrawal, M., Mukherjee, N., Sen, C., Croxton, S. and Agarwal, R. (2000) 'The Role and Significance of Urban and Peri-urban Agriculture to the Local Community and the Economy' in *The Impacts and Policy Implications of Air Pollution on Agriculture in India,* Department for International Development (DFID), ERP Research Project R6992

Marshall, F., Poole, N., Bhupal, D. S. and Lintelo, D. (2003) *Enhancing Food Chain Integrity: Food Quality Assurance Mechanisms for Peri-Urban Vegetable Production,* DFID CPHP R7130 Final Technical Report

Marshall, F. M., Holden, J., Ghose, C., Chisala, B., Kapungwe, E., Volk, J., Agrawal, M., Agarwal, R., Sharma, R. and Sing, R. (2005) *Contaminated Water and Food Safety for the Urgan and Peri-urban Poor: Appropriate Measures for Monitoring and Control from Field Research in India and Zambia, Inception Report,* Department for International Development (DFID), EnKaR Research Project R8160

Mcgranahan, G and Kjellen, M. (2006) *Informal Water Vendors and Urban Poor,* Human Settlement Water Paper Series Water 3, London: International Institute of Environment and Development

McKenzie, D. and I. Ray. (2009) 'Urban Water Supply in India: Status, Reform Options and Possible Lessons', *Water Policy,* 11,4:442-460

Mehta, L. (2003) 'Struggles Around "Publicness" and the Right to Access: Perspectives from the Water Domain', in Kaul, I. (ed.), *Global Public Goods: Making Globalisation Work for All,* New York: Oxford University Press

Mehta, L. and Canal, O. M. (2004), *Financing Water for All: Behind the Border Policy Convergence in Water Management,* IDS Working Paper 233, Brighton: Institute of Development Studies

Mehta, L., Marshall, F., Movik, S., Sterling, A., Shah, E., Smith, A. and Thompson, J. (2007) *Liquid Dynamics: Challenges for Sustainability in Water and Sanitation,* STEPS Working Paper 6, Brighton: STEPS Centre

Miranda, J. J. and Patel, V. (2005) 'Achieving the Millennium Development Goals: Does Mental Health Play a Role?' *PLoS Med,* 2.10: 291

Mitchell, T. (1988) *Colonizing Egypt,* New York: Cambridge University Press

Milton, D. and Thompson, J. (1995), 'Participatory Approaches in Urban Areas: Strengthening Civil Society or Reinforcing the Status quo?' *Environment and Urbanization,* 7.1: 231-250

Moffat, T. and Finnis, E. (2005) 'Considering Social and Material Resources: The Political Ecology of a Peri-Urban Squatter Community in Nepal', *Habitat International,* 29: 453-468

Mortimore, M. and Wilson, J. (1965) *Land and People in the Kano Close-Settled Zone,* Occasional Paper No. 1, Department of Geography, Zaria: Ahmadu Bello University

Mukandala, R. (1998) 'Decentralization and Democratization in Tanzania', in Barkan, J. (ed.), *Five Monographs on Decentralization and Democratization in Sub-Saharan Africa,* Iowa City: University of Iowa

Narain, V. and Nischal, S. (2007) 'The Peri-Urban Interface in Shahpur Khurd and Karnera, India', *Environment and Urbanization,* 19.1: 261-273

National Alliance of People's Movement (NAPM) (2008), available at www.narmada.org/resources/NAPM.pdf , accessed on 03 September 2009

Niemczynowicz, J. (1999) 'Urban Hydrology and Water Management: Present and Future Challenges', *Urban Water,* 1: 1-14

Ompad, D. C., Galea, S., Caiaffa, W. T. and Vlahov, D. (2007) 'Social Determinants of the Health of Urban Populations: Methodologic Considerations', *Journal of Urban Health,* 84.1: 42-53

Oxhorn, P. (2001) 'Decentralization, Civil Society, and Democratic Governance', *Decentralization,* no.1, June 2001, Woodrow Wilson International Centre for Scholars, available at: www.wilsoncenter.org/topics/pubs/Decentralization%20June%2001.pdf , accessed 03 September 2009

Palit, A., Sur, D., MitraDhar, K. and Saha, M. R. (2005) 'Asymptomatic Cryptosporidiosis in a Peri-urban Slum Setting in Kolkota, India – a Pilot Study' *Japanese Journal of Infectious Disease,* 58: 110-111

Patel, V. (2008) 'Political Economy of Water and People's Protests', *Alternative International,* 16 April

Patnaik, P. (2003) *The Retreat to Unfreedom: Essays on the Emerging World Order,* New Delhi: Tulika Books

Pinto, S. (2004) 'Development without Institutions: Ersatz Medicine and the Politics of Everyday Life in Rural North India', *Cultural Anthropology,* 19: 337-364

Pothukuchi, K. and Kaufman, J. (2000) 'The Food Systems: A Stranger to the Planning Field', *American Planning Association Journal,* 66.2: 113-124

PUPSR-NRSP (Peri-Urban Production Systems Research – Natural Resources Systems Programme) (1999) *Literature Review on Peri-Urban Natural Resource Conceptualisation and Management Approaches,* Final Technical Report Project No. R6949, University of Nottingham and University of Liverpool

Qadeer, I. and Roy, D. (1989) 'Work, Wealth and Health: Sociology of Workers' Health in India', *Social Scientist,* 17.5/6: 45-92

Ramanathan, U. (2005) 'Demolition Drive', *Economic and Political Weekly,* July 2: 2908-2912

Ramanathan, U. (2006) 'Creating Dispensable Citizens', *The Hindu,* April 14, New Delhi

Ratho, R. K., Mishra, B., Kaur, J., Kakkar, N. and Sharma, K. (2005) 'An Outbreak of Dengue Fever in Peri-urban Slums in Chandigarh, India, with Special Reference to Entomological and Climactic Factors', *Indian Journal of Medical Sciences,* 59(12)

Roberts, B. R. (2005) 'Globalization and Latin American Cities', *International Journal of Urban and Regional Research,* 29 (1): 110-123

Rohilla, S. K. (2005) 'Defining "Peri-Urban": A Review', in Dupont, V. (ed.) *Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises. A Review of Concepts and General Issues,* New Delhi: Centre de Sciences Humaines

Roy, A. (2002) *City Requiem, Calcutta: Gender and the Politics of Poverty,* Minneapolis: University of Minnesota Press

Roy, D. (2004) 'From Home to Estate', *Seminar,* 533: 68-75

Ruel, M. T., Haddad, H. and Garret, J. L. (1999) 'Some Urban Facts of Life: Implications for Research and Policy', *World Development,* 27.11: 1917-1938

Ruet, J., Gambiez, M. and Lacour, E. (2006), 'Private Appropriation of Resource: Impact of Peri-urban Farmers Selling Water to Chennai Metropolitan Water Board', *Cities,* 24.2: 110-121

Ruet, J., Saravanan, V. S. and Zérah, M. H. (2002) *The Water and Sanitation Scenario in Indian Metropolitan Cities: Resource and Management in Delhi, Calcutta, Chennai, Mumbai,* CSH Occasional Paper No.6, New Delhi: Centre de Sciences Humaines

Sassen, S. (2002) 'Locating Cities on Global Circuits', *Environment and Urbanization,* 14.1: 13-30

Satterthwaite, D. (2007) *The Transition to a Predominantly Urban World and its Underpinnings,* Human Settlements Discussion Paper Series, London: IIED

Satterthwaite, D. McGranahan, G. and Milton, D. (2005) *Community-driven Development for Water and Sanitation in Urban Areas,* a study commissioned by the Water Supply and Sanitation Collaborative Council (WSSCC), Geneva as an input to the 13th session of the Commission on Sustainable Development, April 2005, New York

Schönwalder, G. (1997) 'New Democratic Spaces at the Grassroots? Popular Participation in Latin America local Governments', *Development and Change,* 28.4: 753-70

Scott, J. C. (1998) *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed, New Haven:* Yale University Press

Sharma, R. K., Agrawal, M. and Marshall, F. (2008) 'Heavy Metal (Cu, Zn, Cd and Pb) Contamination of Vegetables in Urban India: A Case Study in Varanasi', *Environmental Pollution,* 154.2: 254-63

Shatkin, G. (2007) 'Global Cities of the South: Emerging Perspectives on Growth and Inequality', *Cities,* 24(1): 1-15

Shaw, A. and Satish, M. K. (2007) 'Metropolitan Restructuring in Post-Liberalized India: Separating the Global and the Local', *Cities,* 24.2: 148-163

Simon, D., MacGregor, D., Nsiah-Gyabaah, K. and Thompson, D. (2003) 'Poverty Elimination, North-South Research Collaboration, and the Politics of Participatory Development', *Development in Practice,* 13.1: 40-56

Sing, R. and Druijven, P. C. J. (1994) 'Environmental Degradation and its Socio-economic Implications in the Rural-urban Fringe of Delhi', Project Outline IDPAD 4.1.1, Delhi/Groningen

Singh, S. and Kumar, M. (2006) 'Heavy Metal Load of Soil, Water and Vegetables in Peri-Urban Delhi', *Environmental Monitoring and Assessment,* 120: 79-91

Smart, A. and Smart, J. (2003) 'Urbanization and the Global Perspective', *Annual Review of Anthropology,* 32: 263 – 285

Smith, N. (2002) 'New Globalism, New Urbanism: Gentrification as Global Urban Strategy', *Antipode,* 34.2: 427-450

Solo, T. M., Perez, E. and Joyce, S. (1993) *Constraint in Providing Water and Sanitation Services to the Urban Poor,* WASH Technical Report No. 85, Washington DC: U S Agency for International Development

South Asia Forum for Human Rights (2008) available at www.safhr.org/docuement_2.htm, accessed 03 September 2009

SPARC India (2008) available at www.sparcindia.org/, accessed 03 September 2009

Stiglitz, J. E. (2002) *Globalisation and its Discontents,* New Delhi: Penguin Books India (P) Ltd.

Stirling, A., Leach, M., Mehta, L., Scoones, I., Smith, A., Stagl, S. and Thompson, J. (2007) *Empowering Designs: Towards More Progressive Appraisal of Sustainability,* STEPS Working Paper 3, Brighton: STEPS Centre

Storey, D. (2003) 'The Peri-Urban Pacific: From Exclusive to Inclusive Cities', *Asia Pacific Viewpoint,* 44.3: 259-279

Tacoli, C. (ed.) (2006) *The Earthscan Reader in Rural Urban Linkages,* London: Earthscan

Thong, B. (1995) 'Challenges of Super Induced Development: The Mega-Urban Region of Kuala Lumpur-Klang Valley', in McGee, T. G. and Robinson, I. M. (eds.) *The Mega-Urban Regions of Southeast Asia,* Vancouver: University of British Columbia Press

Torres, H. and Costa, H. (2007) 'São Paula Peri-Urban Dynamics: Some Social Causes and Environmental Consequences', *Environment and Urbanization,* 19.1: 207-223

UNFPA (2007) *State of World Population, 2007: Unleashing the Potential of Urban Growth,* United Nations Population Fund, available at www.unfpa.org/swp/2007/presskit/pdf/sowp2007_eng.pdf, accessed 01 September 2009

Unnithan, K. M. (forthcoming) 'Migration, Motherhood and Child Health: Women's Understandings of Mobility, Birth and Urban Poverty in Rajasthan', in Hampshire, K. and Coleman, S. (eds.), *Space, Health and Movement,* Oxford: Berghahn Press

Verma, G. D. (2003), *Slumming Delhi: Evictions, Endowments and Entitlements,* Talk at India International Centre on 18th January 2003 in the series of pre-conference activities on 'Revitalizing Delhi' organised by Katha prior to the Katha International Literary Festival 'Deep Stories and Silences', New Delhi

Zérah, M. H. (2000) *Water: Unreliable Supply in Delhi,* New Delhi: Manohar Publishers

Zérah, M. H. (2003) 'Modes and Practices of Participation in Urban Water Supply and Sanitation Services', Paper Presented at the Conference on Market Development of Water and Waste Technologies through Environmental Economics, 30th-31st October 2003, Delhi

Zérah, M. H. (2007) 'Conflict between Green Space Preservation and Housing Needs: The Case of the Sanjay Gandhi National Park in Mumbai', *Cities,* 24.2: 122-132